MITSUBISHI ELECTRIC

Changes for the Better

MELSEC Q series

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MELSOFT

CC-Link

Mitsubishi Electric Corporation Nagoya Works is a factory certified for ISO14001 (standards for environmental management systems) and ISO9001 (standards for quality assurance management systems)

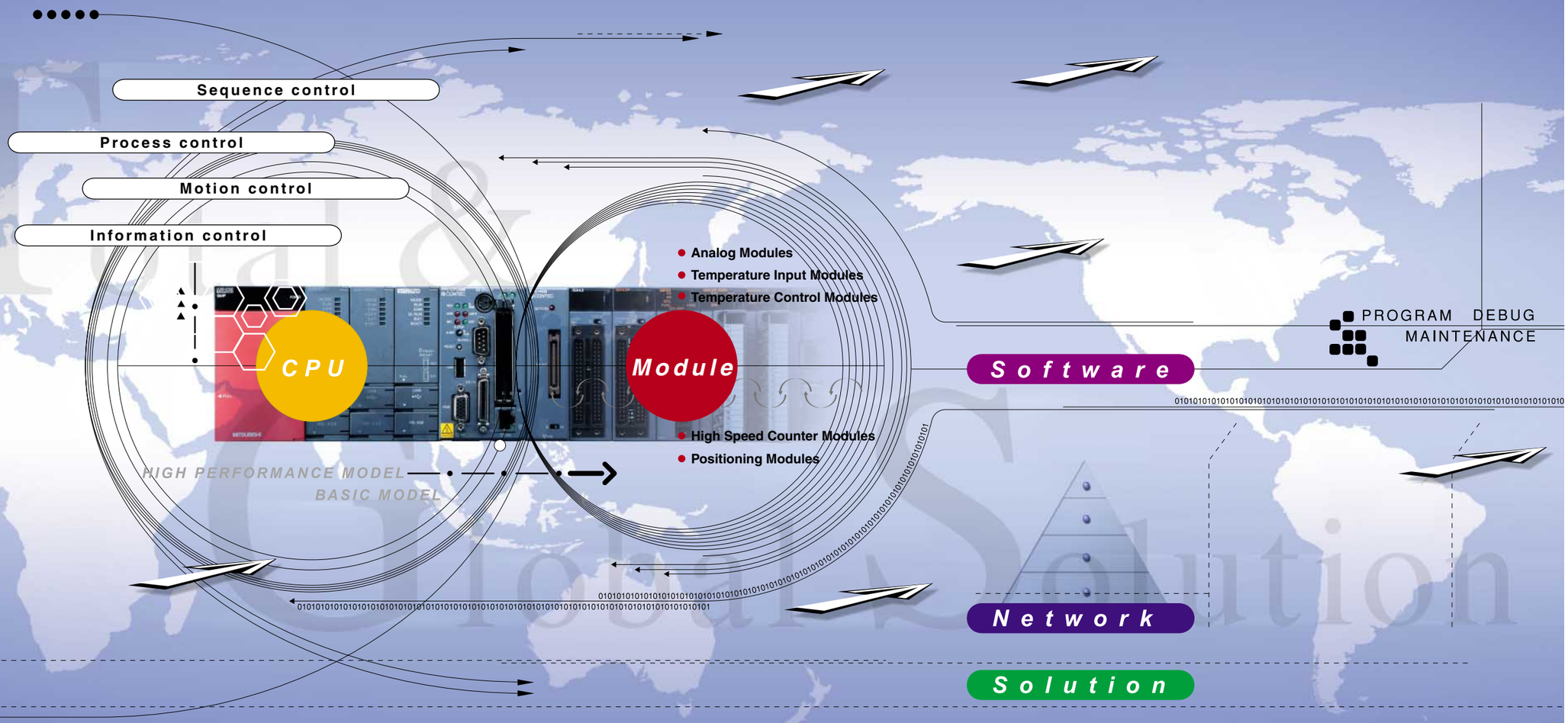
ISO 14001 JACO UKAS ENVIRONMENTAL MANAGEMENT 051

BVQI ISO 9001 UKAS QUALITY MANAGEMENT 008

An automation solution specific to your needs

The MELSEC Q series offers 'total and global' solutions for a diverse range of applications.

The MELSEC Q series continues to advance the state of the art in automation control.
The Q series is an enhancement of Mitsubishi Electric's vast automation system expertise, whilst inheriting the technical know how of the MELSEC A and QnA series.
This unique series is able to integrate four types of automation control, sequence, motion, process, and information (PC based) onto a single system. Therefore, offering significant benefits for the user in terms of development, functionality, performance, and maintenance.



Total & Global Solution

MELSEC Q series

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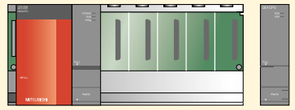
Q series lineup

CPU Modules

◎PLC CPU

Basic Model QCPU



CPU type	Program capacity	Number of I/O points
Q00JCPU	8k steps	256 points
Q00CPU	8k steps	1024 points
Q01CPU	14k steps	1024 points

High Performance Model QCPU

CPU type	Program capacity	Number of I/O points
Q02CPU	28k steps	4096 points
Q02HCPU	28k steps	4096 points
Q06HCPU	60k steps	4096 points
Q12HCPU	124k steps	4096 points
Q25HCPU	252k steps	4096 points

◎Process CPU

CPU type	Program capacity	Number of I/O points
Q12PHCPU	124k steps	4096 points
Q25PHCPU	252k steps	4096 points

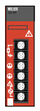
◎Motion CPU

CPU type	Number of control axes
Q172CPUN	8 axes
Q173CPUN	32 axes

Power Supply Modules

Q61P-A1
100 to 120VAC input
5VDC 6A output

Q61P-A2
200 to 240VAC input
5VDC 6A output



Q61SP<Slim type>
100 to 240VAC input
5VDC 2A output

Q62P
100 to 240VAC input
5VDC 3A output
24VDC 0.6A output

Q63P
24VDC input
5VDC 6A output

Q64P
100 to 120/200 to 240VAC input
5VDC 8.5A output

Memory Cards

SRAM cards
Q2MEM-1MBS
Q2MEM-2MBS

Flash cards
Q2MEM-2MBF
Q2MEM-4MBF

ATA cards
Q2MEM-8MBA
Q2MEM-16MBA
Q2MEM-32MBA

PC card adaptor
Q2MEM-ADP

Network/Information Processing Modules

◎**Ethernet Modules**
QJ71E71-100
QJ71E71-B5
QJ71E71-B2

◎**MELSECNET/H Modules**
QJ71LP21-25 QJ72LP25-25
QJ71LP21S-25 QJ72LP25G
QJ71LP21G QJ72LP25GE
QJ71LP21GE QJ72BR15
QJ71BR11

MELSECNET/H PC I/F board
Q80BD-J71LP21-25
Q80BD-J71LP21G
Q80BD-J71LP21GE
Q80BD-J71BR11

◎**CC-Link Module**
QJ61BT11N

CC-Link PC I/F board
A80BDE-J61BT11
A80BDE-J61BT13

◎**CC-Link/LT Module**
QJ61CL12

◎**Serial Communication Modules**
QJ71C24N
QJ71C24N-R2
QJ71C24N-R4

◎**FL-net (OPCN-2) Interface Modules**
QJ71FL71-T-F01
QJ71FL71-B5-F01
QJ71FL71-B2-F01

◎**AS-I Master Module**
QJ71AS92

◎**Intelligent Communication Modules**
QD51
QD51-R24

Intelligent Function Modules

◎**Analog Modules**
A/D Converter Modules
Q64AD-GH
Q62AD-DGH
Q64AD
Q68ADV
Q68ADI

D/A Converter Modules
Q62DA-FG
Q62DA
Q64DA
Q68DAV
Q68DAI

◎**Temperature Control Modules**
Q64TCTT
Q64TCTTBW
Q64TCRT
Q64TCRTBW

◎**Temperature Input Modules**
Q64TDV-GH
Q64TD
Q64RD-G
Q64RD

◎**Positioning Modules**
QD75P1
QD75P2
QD75P4
QD75D1
QD75D2
QD75D4
QD75M1
QD75M2
QD75M4

QD70P4
QD70P8

◎**Channel-Isolated Pulse Input Module**
QD70P8-G

◎**High Speed Counter Modules**
QD62
QD62D
QD62E

Input Modules

Number of I/P points	100 to 120V AC	100 to 240V AC	24VDC (positive common)	5/12VDC (positive/negative common)	24VDC (negative common)
8 points		QX28	QX48Y57*1		
16 points	QX10		QX40 QX40-S1	QX70	QX80
32 points			QX41 QX41-S1 QH42P*1	QX71	QX81
64 points			QX42 QX42-S1	QX72	QX82 QX82-S1

*1: Input specifications for I/O composite module

Output Modules

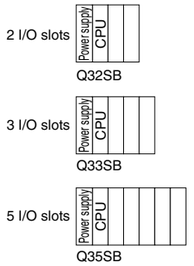
Number of O/P points	Relay 24VDC, 240VAC	Triac 100 to 240VAC	Transistor 12 to 24VDC (sink)	Transistor 12 to 24VDC (sink/source)	Transistor 5 to 12VDC (sink)	Transistor 12 to 24VDC (source)
7 points			QX48Y57 0.5A/point*2			
8 points	QY18A 2A/point			QY68A 2A/point		
16 points	QY10 2A/point	QY22 0.6A/point	QY40P 0.1A/point QY50 0.5A/point		QY70 16mA/point	QY80 0.5A/point
32 points			QY41P 0.1A/point QH42P 0.1A/point*2		QY71 16mA/point	QY81P 0.1A/point
64 points			QY42P 0.1A/point			

*2: Output specifications for I/O composite module

Base Units, Extension Cables

◎Slim type main base unit

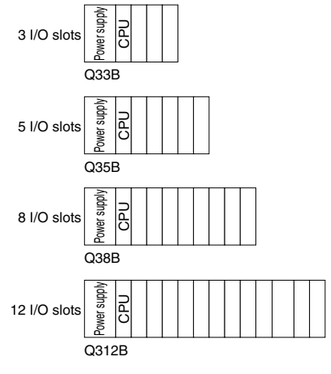
Main base unit (Power supply module required; cannot be extended)



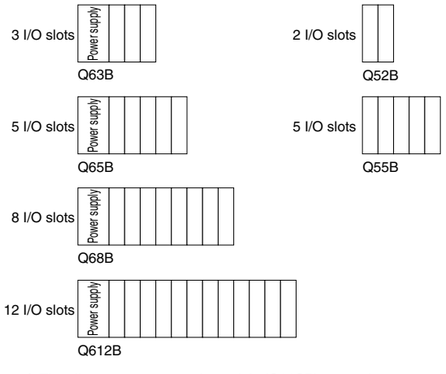
* Only the slim type power supply module (Q61SP) can be used.
* This does not support the Process CPU.

◎Main base unit

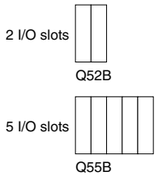
Main base unit (Power supply module required; can be extended)



Extension base unit (Power supply module required; can be extended)



Extension base unit (Power supply module not required; can be extended)



※ The slim type power supply module (Q61SP) cannot be mounted.

◎Extension Cables

QC05B (0.45m)
QC06B (0.6m)
QC12B (1.2m)
QC30B (3.0m)
QC50B (5.0m)
QC100B (10.0m)

Accessories

◎**Batteries**
Q6BAT
Q7BAT (-SET)
Q2MEM-BAT (for SRAM memory card)

◎**Connectors for I/O Modules**
40-pin connector type
A6CON1 (soldering type)
A6CON2 (crimp-contact type)
A6CON3 (pressure-displacement type)
A6CON4 (soldering type)

37-pin D sub connector type
A6CON1E (soldering type)
A6CON2E (crimp-contact type)
A6CON3E (pressure-displacement type)

◎**DIN rail Adapter**
Q6DIN1
Q6DIN2
Q6DIN3

◎**Spring clamp Terminal Block**
Q6TE-18S

◎**IDC Terminal Block Adaptor, Dedicated Tool**
Q6TA32
Q6TA32-TOL

◎**Connection Cable**
QC30R2

◎**Connector Disconnection Prevention Holder**
Q6HLD-R2

Other Modules

◎**Interrupt Module**
QI60

◎**Blank Cover**
QG60

MELSOFT

GX Developer
MELSEC PLC programming software

GX Simulator
MELSEC PLC simulation software

GX Explorer
Project control tool

GX Converter
Excel/text data converter

GX Configurator
Intelligent function module setting and monitor tool

GX RemoteService-I
Remote access tool

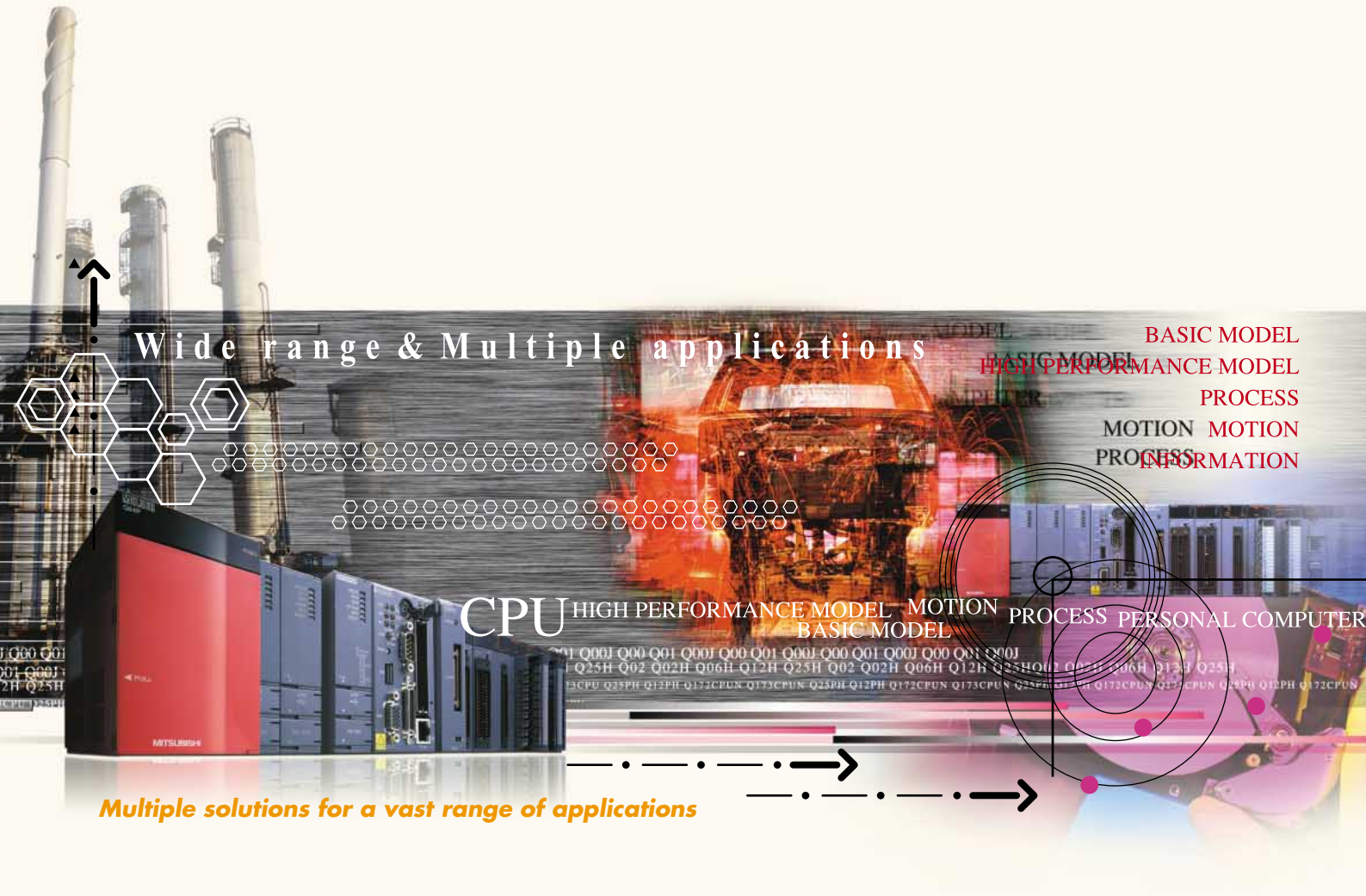
PX Developer
FBD software package for Process control

MT Developer
Integral startup support software for Q Motion

MX Component
ActiveX® library for communication

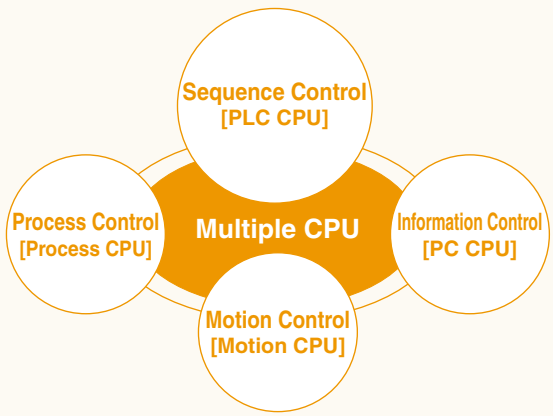
MX Sheet
Excel communication support tool

CPU



Q series CPU lineup provides answers for a vast range of application requirements.

The Q series lineup covers a various range of applications be it, PLC, process, motion, or information control. The basic model QCPU range is designed ideally for small scale applications. With the unique Multiple CPU functionality, each process area of the application can be selectively controlled by different CPUs situated on the same main base unit. Therefore, this lineup provides an ideal solution for each required application.



Combine the CPUs to fit specific application requirements, from basic sequence control to advanced multiple CPU control.

Combine upto 4 CPUs on a single Q series system to provide the ideal solution for your application.

PLC CPU

Basic Model QCPU

Q00JCPU • Program Capacity: 8K steps • Number of I/O Points: 256 points
• Number of I/O device points: 2048 points
• Integrated CPU with power supply and 5 slots

Q00CPU • Program Capacity: 8K steps • Number of I/O Points: 1024 points
• Number of I/O device points: 2048 points

Q01CPU • Program Capacity: 14K steps • Number of I/O Points: 1024 points
• Number of I/O device points: 2048 points

High Performance Model QCPU

Q02CPU • Program Capacity: 28K steps • Number of I/O Points: 4096 points
• Number of I/O device points: 8192 points

Q02HCPU • Program Capacity: 28K steps • Number of I/O Points: 4096 points
• Number of I/O device points: 8192 points

Q06HCPU • Program Capacity: 60K steps • Number of I/O Points: 4096 points
• Number of I/O device points: 8192 points

Q12HCPU • Program Capacity: 124K steps • Number of I/O Points: 4096 points
• Number of I/O device points: 8192 points

Q25HCPU • Program Capacity: 252K steps • Number of I/O Points: 4096 points
• Number of I/O device points: 8192 points

High performance CPUs with a diverse and powerful process control instruction set.

Process CPU (MELSEC Process Control)

Q12PHCPU • Program Capacity: 124K steps • Number of I/O Points: 4096 points
• Number of I/O device points: 8192 points

Q25PHCPU • Program Capacity: 252K steps • Number of I/O Points: 4096 points
• Number of I/O device points: 8192 points

Designed for next generation's high-speed motion and multi-axis control.

Motion CPU

Q172CPUN • For 8-axis control

Q173CPUN • For 32-axis control

A fully featured Microsoft™ Windows™ personal computer directly on the Q Series base unit.

Personal Computer CPU

[Partner products]

Offers unlimited open control opportunities while maintaining tight integration with other Q Series system components.

See pages 35 and 36 for more information on partner products.

High performance and flexibility on a small footprint

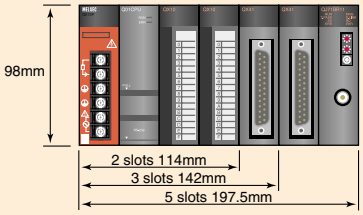
Mounting Area

In the Q series, 2, 3, 5, 8 and 12 I/O slots main base units are available. The mounting area can be further reduced by using the slim type base unit.

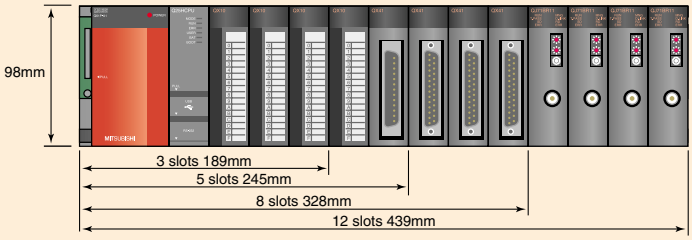
Mounting Area

(Depth: 98mm)

Slim type main base unit



Main base unit



Note) The slim type base cannot be used with the process CPU.

Mounting Freedom

Choose from 2, 3, 5, 8 and 12 I/O slot bases to design the best system for the required application. Connect extension bases directly by using cables alone. Therefore, no need for network modules, adapters, or configuration software to distribute base units over an extended distance. Extension bases that do not require a power supply module are available to further reduce space and costs.

◎Types of slim type main base units (power supply module required)

Number of I/O Slots	Main Base	Mounting Dimensions (mm)
2	Q32SB	114 × 98
3	Q33SB	142 × 98
5	Q35SB	197.5 × 98

◎Base unit types (power supply module required)

Number of I/O Slots	Main Base	Extension Base	Mounting Dimensions (mm)
3	Q33B	Q63B	189 × 98
5	Q35B	Q65B	245 × 98
8	Q38B	Q68B	328 × 98
12	Q312B	Q612B	439 × 98

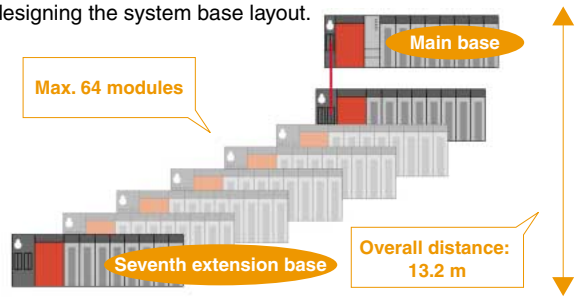
◎Base unit types (Requires no power supply module)

Number of I/O Slots	Extension Base	Mounting Dimensions (mm)
2	Q52B	106 × 98
5	Q55B	189 × 98

Note) The slim type main base unit cannot be connected with an extension base. Also, the process CPU cannot be used.

Up to 7 Extension Bases Connectable

Up to seven extension bases (eight when counting the main base) can be connected to accept up to 64 modules. Also, the overall distance of extension cables is max. 13.2m, enabling high freedom for designing the system base layout.



CPU		Number of Extension Base Units	Number of Loaded Modules	Overall Extension Cable Length (m)
Basic Model	Q00JCPU	2 (max.)	16 (max.)	13.2 (max.)
	Q00CPU	4 (max.)	24 (max.)	
	Q01CPU			
High-Performance Model	Q02CPU	7 (max.)	64 (max.)	
	Q02HCPU			
	Q06HCPU			
	Q12HCPU			
	Q25HCPU			
Process CPU	Q12PHCPU			
	Q25PHCPU			

*If a 12-slot base is used, the maximum number of I/O, intelligent function and network modules mounted is 16/24/64 respectively.

Number of Control I/O Points

The Q series can control a maximum of 8192 points (input device points) in a remote I/O network such as CC-Link, or a maximum of 4096 points (I/O points) for direct I/O only.

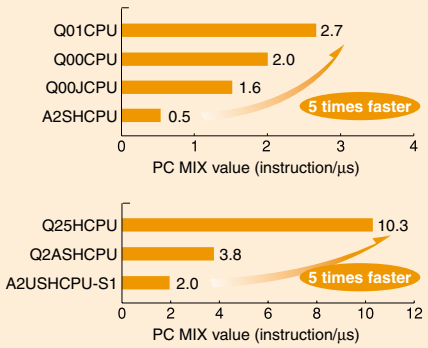
Note 1) Number of I/O points on main and extension bases directly controllable by a CPU module.
Note 2) Total number of I/O points on main and extension bases directly controllable by a CPU module and I/O points that can be controlled as remote I/O by a remote I/O network.

CPU		Number of I/O Points (Note 1)	Number of I/O Device Points (Including remote I/O points) (Note 2)
Basic Model	Q00JCPU	256	2048
	Q00CPU	1024	
	Q01CPU		
High-Performance Model	Q02CPU	4096	8192
	Q02HCPU		
	Q06HCPU		
	Q12HCPU		
	Q25HCPU		
Process CPU	Q12PHCPU		
	Q25PHCPU		

Increased Operation Processing Speeds

Q series offers some of the highest processing performance on the market today; basic instruction processing time is 34ns and PC MIX value is 10.3. By Mitsubishi's own “PC-MIX” performance metric, it is about 5 times faster than A2USHCPU-S1 and about 2.7 times faster than the Q2ASHCPU. The CPU has dramatically increased floating-point operation speeds for PID and other arithmetic functions. The PC-MIX aims to replicate real-word application performance by executing a mixed instruction set.

◎PC MIX value comparison



CPU operation processing speeds

Instruction \ CPU	Basic Model			High-performance Model		Process CPU
	Q00JCPU	Q00CPU	Q01CPU	Q02CPU	Q02HCPU Q06HCPU Q12HCPU Q25HCPU	Q12PHCPU Q25PHCPU
LD (LD X0)	200ns	160ns	100ns	79ns	34ns	
OUT (OUT Y0)	200ns	160ns	100ns	158ns	68ns	
Timer (OUT T0 K5)	1100ns	880ns	550ns	632ns	272ns	
Transfer (MOV D0 D1)	700ns	560ns	350ns	237ns	102ns	
Addition (+ D0 D1)	1000ns	800ns	500ns	395ns	170ns	
Floating-point addition (E+)	65.5μs	60.5μs	49.5μs	1815ns	782ns	
PC MIX value (Instruction/μs)	1.6	2.0	2.7	4.4	10.3	

* The PC MIX value is the average number of instructions such as the basic and data processing instructions executed in 1 μs. A larger value indicates a higher processing speed.

Program Capacities and Large Standard RAM Capacities

To construct small to large scaled systems, the Q series has a wide variation of CPU modules having 8k to 252k step program capacities and up to 256k bytes, large-capacity standard RAMs, to meet the application requirements from basic sequence control up to complex multi-discipline applications.
A standard ROM (flash ROM) is built-in to enable ROM operation without a memory card.
The efficient use of memory space allows the CPU to contain twice the program of previous Mitsubishi controllers (AnSHCPU).

CPU		Program Capacities (Steps)	Device Memory (Words)	Standard RAM (Bytes) (Note 3)	Standard ROM (Bytes)	Memory Card (Number of slots)
Basic Model	Q00JCPU	8k	18k	No	58k	No
	Q00CPU			128k	94k	
	Q01CPU	14k				
High-Performance Model	Q02CPU	28k	29k	64k	112k	1
	Q02HCPU			128k		
	Q06HCPU	60k			240k	
	Q12HCPU	124k		256k	496k	
	Q25HCPU	252k			1008k	
Process CPU	Q12PHCPU	124k			496k	
	Q25PHCPU	252k			1008k	

Note 3) Memory that stores the data used in sequence programs such as file registers and local devices (with the exception of Basic Model CPU). As a built-in type RAM, the sequence program having a lot of file registers and local devices stored in standard RAM can run rapidly.

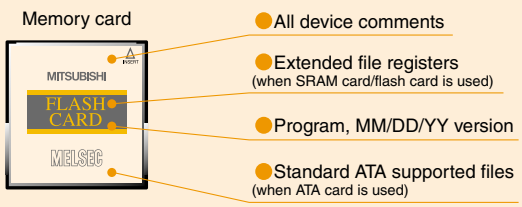
Extended Memory

The High-Performance Model QCPU and Process CPU accepts a range of optional memory cards that expand the processor's capacity up to 32MB. Memory types available are SRAM card (1MB/2MB), flash card (2MB/4MB), or ATA card(8MB/16MB/32MB).
Depending on the memory used, storage for general purpose files such as Adobe™ Acrobat™, or CAD files is possible directly in the CPU, which allows system documentation to reside directly in the controller. Storage for machine comments and file register data is also possible.

◎Memory capacity

Type	Memory card type	Memory card capacity	Number of storable files (files)
SRAM card	Q2MEM-1MBS	1011.5k bytes (Note 4)	256
	Q2MEM-2MBS	2034k bytes (Note 4)	288
FLASH card	Q2MEM-2MBF	2035k bytes	
	Q2MEM-4MBF	4079k bytes	
ATA card	Q2MEM-8MBA	7940k bytes (Note 4)	512
	Q2MEM-16MBA	15932k bytes (Note 4)	
	Q2MEM-32MBA	31854k bytes (Note 4)	

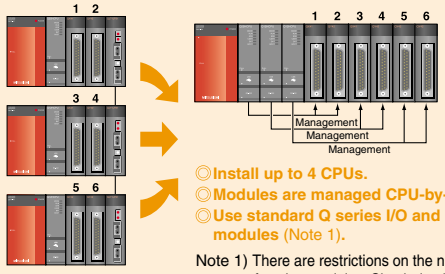
Note 4) The SRAM card and ATA card memory capacity is the value after formatting.



Advanced multi-disciplinary automation that reaches beyond the

Multiple CPU System Configuration

The Q series can combine multiple CPUs together on the same system to build the required application configuration. Control of I/O modules can be segmented between different CPUs. CPUs communicate with each other via shared memory, and can increase system performance by distributing tasks between different CPUs. A variety of methods exist for controlling the methods by which CPUs communicate, but in each case the development effort is simplified by available software tools.



◎Install up to 4 CPUs.
◎Modules are managed CPU-by-CPU.
◎Use standard Q series I/O and intelligent function modules (Note 1).

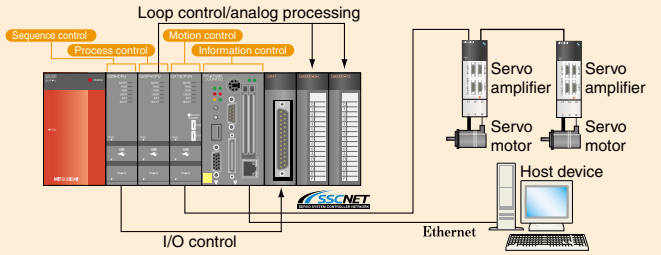
Note 1) There are restrictions on the number and versions for intelligent function modules. Check details in the Q series data book.

Integration of Process CPU, Motion CPU, and PC CPU

The Q series multiple CPU system function allows PLC CPU, process, motion, and personal computer CPUs to be mounted together, enabling utilization of their respective strong points and design of an optimal system.

Note) Only the following combinations can be used with the Basic Model.
- Basic Model CPU + Motion CPU
- Basic Model CPU + PC CPU
- Basic Model CPU + Motion CPU+ PC CPU

* SSCNET is a network where the motion CPU and servo amplifiers are connected with minimum wiring by high-speed serial communication.



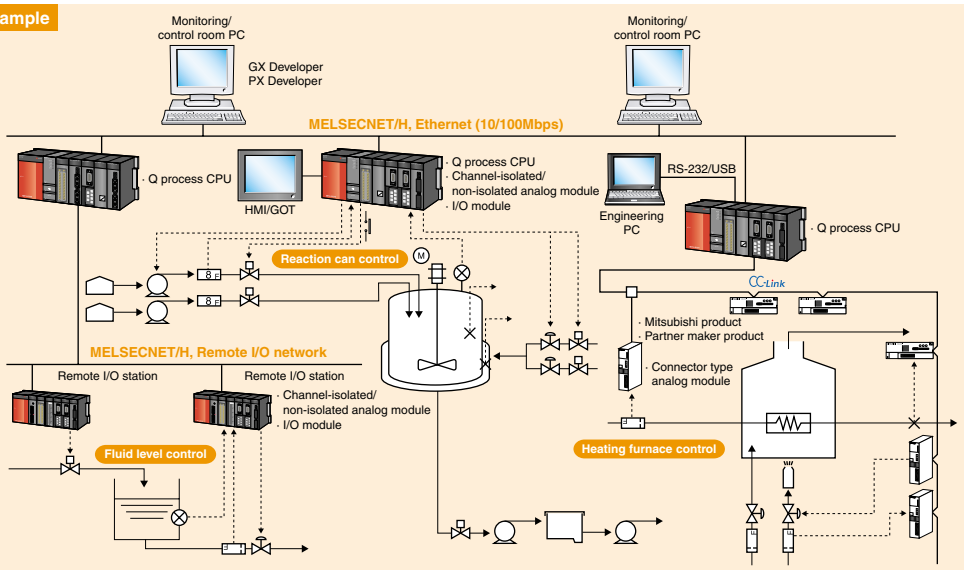
Process Control

Process CPU

Q series offers a feature that rivals those of costly DCS systems at a fraction of the cost. Q Series is adept at the automation of process systems with the simple addition of one or more process CPUs to the controller. The process CPUs are complemented by a range of channel-isolated high resolution analog I/O modules with online change (hot-swap) capability, and the PX Developer function block programming software environment. (Refer to the "MELSEC Process Control Catalog" for more information on the process CPU.)

- The "Process CPU" builds on the capability of the equivalent sequence CPU with the addition of an array of powerful process instructions.
- "Channel-isolated high resolution analog module" further enhance process control using the PLC.
- Combine the Process CPUs with the redundant network capabilities of the MELSECNET/H control level network. This offers high performance, robust, and deterministic communications between multiple Q Series systems, regardless of their assigned control tasks.

System configuration example



boundaries of traditional controllers

Motion Control

Motion CPU

Mitsubishi Electric Motion controller realizes high-speed control of up to 32 axes (96 axes per Q series system) directly from the motion CPUs with no intermediate motion control modules. This offers large cost savings, especially when complex wiring is eliminated due to the “daisy-chain” connection of Mitsubishi intelligent digital servos. (Refer to the “Motion Controller Catalog” for more information on the Motion CPU.)

- 0.88ms motion operation cycle time assures high performance operation, even with high-speed cam profile emulation.
- Together with the shortened communication cycle time (0.88ms), the synchronization performance and speed/positioning control accuracy is substantially improved.
- Motion CPU can be used together with any type of Q series CPU as required.
- Via Mitsubishi’s high performance SSCNET motion network technology, Q series offers significant engineering and operation benefits for motion control.

* SSCNET is a high-speed serial communication network that connects the motion CPU and servo amplifier.

System configuration example

Information Control

PC CPU

MELSEC Recognized

Q series is unique in being able to mount a full-featured Windows™ PC in a robust industrial format directly on the Q series base unit. This offers the potential to combine it with other Q series CPU types, therefore fully integrating it into the Q I/O system to give complete access to all I/O modules and networking, allowing maximum design flexibility.

- Industrial specification level environmental and noise performance specifications.
- Choose HDD or silicon disk mass storage depending on the operating environment.
- Utilize third party PC applications available for Microsoft™ Windows™, offering a virtually unlimited application scope.
- Includes a wide variety of ports and connections to add third party hardware devices.

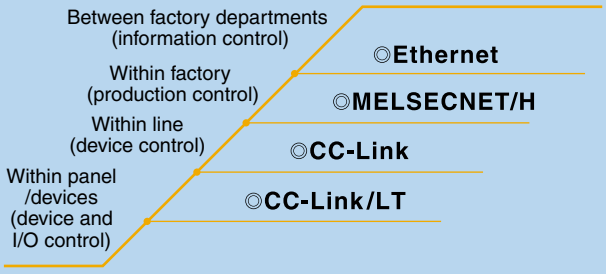
Note) The PC CPU is manufactured by CONTEC, Co., Ltd. Refer to the “Partner Products” on pages 35 and 36 for more information.

Network

Seamless development with full range of networking hierarchy.

Networking support at all levels of the automation hierarchy, scalable to fit any application size

Modern plant systems require networking at many different levels. With Q series, Mitsubishi offers a networking solution that matches these specific requirements. The Mitsubishi solution ranges from top level factory LAN 100Mbit Ethernet, mid-level shop floor control MELSECNET/H, down to device level CC-Link, and CC-Link/LT. The open network CC-Link, which originates from Japan, is a SEMI certified wire saving network, providing the seamless networking required with modern applications. Therefore, the Q series provides a range of network types within each level of the hierarchy to ensure the right solution is provided.



Network modules overview

Enterprise level network

Ethernet Modules

QJ71E71-100 •10BASE-T/100BASE-TX
QJ71E71-B5 •10BASE-5
QJ71E71-B2 •10BASE-2

Control level network

MELSECNET/H Modules

PLC-to-PLC Network: Control station/normal station, Remote I/O network: Master station

QJ71LP21-25 •Optical fiver cable •Duplex loop •25Mbps/10Mbps
QJ71LP21S-25 •Optical fiver cable •Duplex loop •25Mbps/10Mbps
•With external power supply function
QJ71LP21G •Optical GI-50/125 cable •Duplex loop •10Mbps
QJ71LP21GE •Optical GI-62.5/125 cable •Duplex loop •10Mbps
QJ71BR11 •Coaxial cable •Simplex bus •10Mbps

Remote I/O Network: Remote I/O station

QJ72LP25-25 •Optical fiver cable •Duplex loop •25Mbps/10Mbps
QJ72LP25G •Optical GI-50/125 cable •Duplex loop •10Mbps
QJ72LP25GE •Optical GI-62.5/125 cable •Duplex loop •10Mbps
QJ72BR15 •Coaxial cable •Simplex bus •10Mbps

MELSECNET/H PC I/F board (PCI bus)
PLC-to-PLC Network: Control station/normal station

Q80BD-J71LP21-25 •Optical fiver cable •Duplex loop •25Mbps/10Mbps
Q80BD-J71LP21G •Optical GI cable •Duplex loop •10Mbps
Q80BD-J71BR11 •Coaxial cable •Simplex bus •10Mbps

Device level network

CC-Link Modules

QJ61BT11N •Master station/local station •CC-Link Ver. 2 compatible

CC-Link PC I/F board (PCI bus)

A80BDE-J61BT13 •Local station •CC-Link Ver. 1 compatible
A80BDE-J61BT11 •Master station/local station •CC-Link Ver. 1 compatible

Sensor level network

CC-Link/LT Module

QJ61CL12 •Master station

Others

Serial Communication Modules

QJ71C24N •RS-232 1CH •RS-422/485 1CH
QJ71C24N-R2 •RS-232 2CH
QJ71C24N-R4 •RS-422/485 2CH

Intelligent Communication Modules

(BASIC program execution module)

QD51 •RS-232 2CH
QD51-R24 •RS-232 1CH •RS-422/485 1CH

FL-net Modules

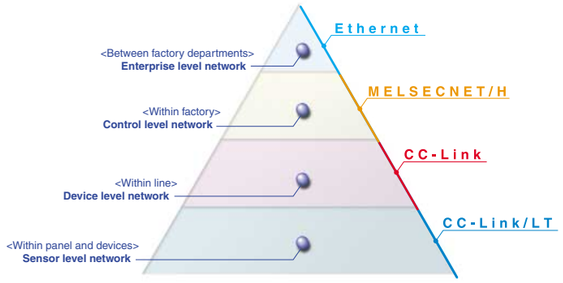
QJ71FL71-T-F01 •10BASE-T •OPCN-2 Version 2.00 compatible
QJ71FL71-B5-F01 •10BASE-5 •OPCN-2 Version 2.00 compatible
QJ71FL71-B2-F01 •10BASE-2 •OPCN-2 Version 2.00 compatible

AS-i Module

QJ71AS92 •Master station, AS-i Standard Version 2.11 compatible

Q series network environment connecting to the future for more freedom.

Seamless integration of the network over all layers



Q series support for open networking.

Q series provides extensive support for applications requiring a diverse range of 3rd party devices on the same network. An example is the open CC-Link device network, which originated from Japan through Mitsubishi, and is now administered by the CC-Link Partner Association (CLPA). CC-Link is a SEMI certified network, with many products available from over 500 different partner companies, with over 1.5 million installed nodes.

Seamless communication

Q series combines enterprise, control, and device level networks together through Ethernet, MELSECNET/H, and CC-Link to allow easy information access, no matter what level it resides on the network hierarchy. It is possible to "drill down" from a high level Ethernet down through multiple network layers, to program the PLC just by having GX Developer installed on the PC.

Event Interrupt

Some network and intelligent function modules include an event interrupt function that can interrupt the high performance QCPU program. With this function, the CPU can rapidly respond to an event that occurs asynchronously with the program scan of the PLC, e.g. data receiving from a network or value compare of a high-speed counter.

Remote password

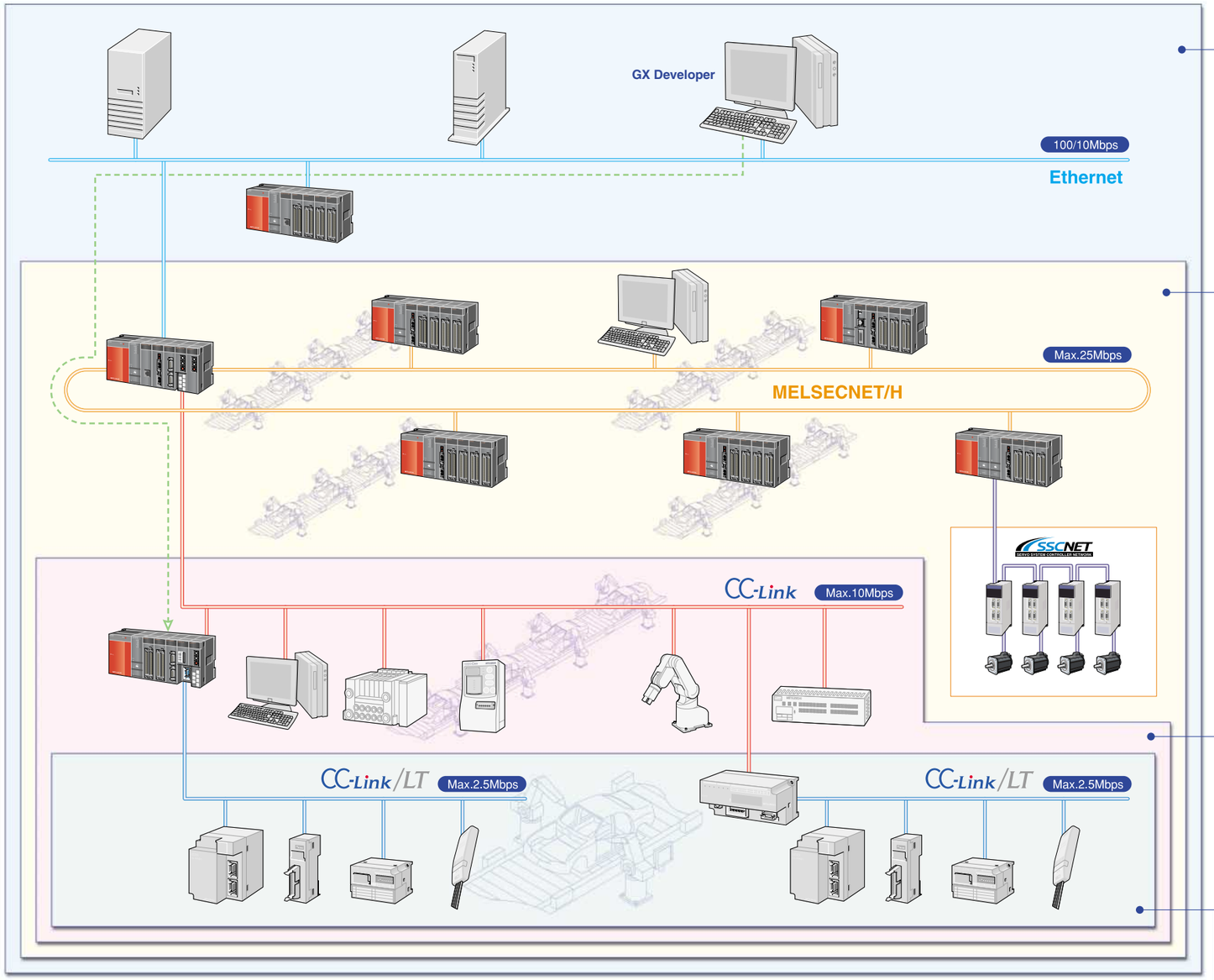
The High-Performance Model QCPU includes a remote password function to provide additional security over remote access. The remote password can be changed or deleted as from within the parameters.

External power supply input capability

Data link can be maintained even if the PLC power fails by using the QJ71LP21S-25 module with external power supply input for MELSECNET/H.

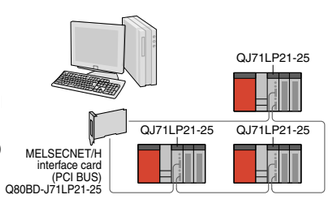
Network diagnostics

GX Developer includes extensive built-in diagnostic tools for Ethernet, MELSECNET/H, CC-Link, and CC-Link/LT. Refer to page 21 for details.



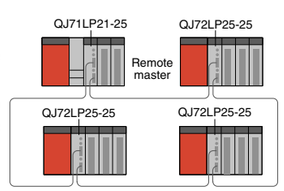
MELSECNET/H PC interface cards

Q series provides the capability to include generic PCs on the MELSECNET/H network via a wide range of PCI interface cards. The software drivers included with these cards allow system integration of 3rd party systems, while also maintaining compatibility with existing MELSECNET/10 installations. Including extensive RAS functions for error detection.



MELSECNET/H Remote I/O Network

MELSECNET/H offers the capability to locate remote bases containing Q series I/O modules on a 25Mbit control level network. The key benefit of this is that complex distributed I/O systems can be built using the same I/O modules as the controller itself. Hence systems that need more than distributed I/O blocks on a network can be addressed with Q Series. Any other station on the network can be accessed from each remote I/O station. In addition, by incorporating the process CPU, redundant remote I/O systems can be realized by using MELSECNET/H master and standby master stations.



Enterprise level network

Ethernet

Ethernet represents the top layer of the network hierarchy used to transfer information around a plant and between different departments. Use this to establish a link to SCADA and other production and quality control management systems.

- 100base-T connections provide easy integration into the existing plant LAN infrastructure
- Simple set-up via standard configuration tools in GX Developer

Control level network

MELSECNET/H

MELSECNET/H is one step down from Ethernet and allows communication between controllers on a line within a plant department. MELSECNET/H offers high performance, fault tolerant, deterministic communications for line interlocking and synchronization between different processes.

- Maximum 25Mbps high-speed communication
- Large capacity link device: 16,384 points each for bits and words
- Improved reliability using duplex optical fiber loop

Device level network

CC-Link

The primary reason for a device level network is to link a controller to numerous different devices to reduce wiring costs while adding additional benefits such as improved diagnostic capability. Together with SEMI certification, CC-Link provides an open device level network with enhanced flexibility in system design and configuration.

- Maximum 10Mbps high-speed communication
- Link device remote I/O points: 8192
- Integrate other 3rd party manufacturers into the Q series system

Sensor level network

CC-Link/LT

At the lowest hierarchial network level, sensor level networks can still reduce wiring costs inside panels between simple discrete devices such as push-buttons and some sensors. Q series fully supports this with the sensor level version of CC-Link, CC-Link/LT. This new addition to the CC-Link family includes tremendous flexibility and cost savings through its innovative connection technology, which does not require cutting/stripping of the network cable to make connections.

- Easy connections with dedicated connectors
- Use I/O points effectively by incorporating number of points mode (4 points, 8 points, 16 points).
- The maximum number of link points is 1024 points in the 16-point mode.

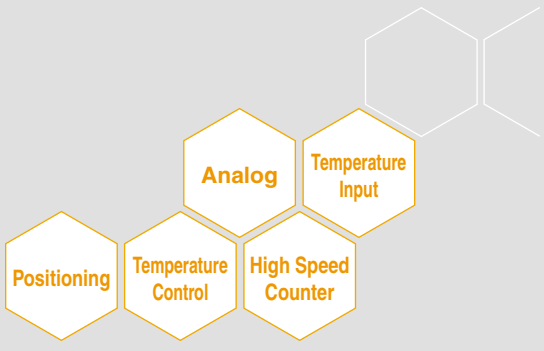
Modules

UNIT
ANALOG
MOTION
TEMPERATURE CONTROL
TEMPERATURE INPUT
Intelligent & High Functionality
POSITION
High-speed
POSITION
Input Output
COUNTER
Q D 7 5 D 2 Q D 7 5 M 1 Q D 7 5 M 2 Q D 7 5 M 4 Q D 7 0 P 4 Q D 7 0 P 8

Intelligently handling advanced control functions

Comprehensive range of I/O and intelligent function modules.

Q series includes a comprehensive range of I/O and intelligent function modules to meet the needs of a diverse range of applications. As well as standard digital and analog I/O types (including channel-isolated analog), also available are motion control, serial communications, temperature controllers, temperature inputs, etc. Therefore realizing a solution ideal for the application, be it high speed positioning or highly accurate temperature control.



Assorted function modules to match every control application.

Analog Module

Analog to Digital Converter Modules

● Channel-isolated type

G64AD-GH • 4ch • Voltage/current input
G62AD-DGH • 2ch • Distributor module

● Channel non-isolated type

Q64AD • 4ch • Voltage/current input
Q68ADV • 8ch • Voltage input
Q68ADI • 8ch • Current input

Digital to Analog Converter Modules

● Channel-isolated type

Q62DA-FG • 2ch • Voltage/current output (With output monitor)

● Channel non-isolated type

Q62DA • 2ch • Voltage/current output
Q64DA • 4ch • Voltage/current output
Q68DAV • 8ch • Voltage output
Q68DAI • 8ch • Current output

Temperature Control Module

Q64TCTT • 4ch • Thermocouple input
• transistor output
Q64TCTTBW • 4ch • Thermocouple input
• transistor output, with wire break detection function
Q64TCRT • 4ch • Platinum temperature-measuring resistor input (3-wire type)
• transistor output
Q64TCRTBW • 4ch • Platinum temperature-measuring resistor input (3-wire type)
• transistor output, with wire break detection function

Temperature Input Module

● Channel-isolated type

Q64TDV-GH • 4ch • Thermocouple input/Micro voltage input
Q64TD • 4ch • Thermocouple input
Q64RD-G • 4ch • Platinum-nickel temperature-measuring resistor input (3/4-wire type)

● Channel non-isolated type

Q64RD • 4ch • Platinum temperature-measuring resistor input (3/4-wire type)

Positioning Module

● Open collector output type

QD70P4 • 4 axes • 200Kpps • Positioning data: 10 data points/axis
QD70P8 • 8 axes • 200Kpps • Positioning data: 10 data points/axis
QD75P1 • 1 axis • 200Kpps • Positioning data: 600 data points/axis
QD75P2 • 2 axes • 200Kpps • Positioning data: 600 data points/axis
QD75P4 • 4 axes • 200Kpps • Positioning data: 600 data points/axis

● Differential driver output type

QD75D1 • 1 axis • 1Mpps • Positioning data: 600 data points/axis
QD75D2 • 2 axes • 1Mpps • Positioning data: 600 data points/axis
QD75D4 • 4 axes • 1Mpps • Positioning data: 600 data points/axis

● SSCNET connection type

QD75M1 • 1 axis • Positioning data: 600 data points/axis
QD75M2 • 2 axes • Positioning data: 600 data points/axis
QD75M4 • 4 axes • Positioning data: 600 data points/axis

Channel-Isolated Pulse Input Module

QD60P8-G • 8ch • 30Kpps • 5/12 to 24 VDC input
• With pre-scale function

High Speed Counter Module

QD62 • 2ch • 200Kpps • 5/12/24 VDC input • Transistor output (sink)
QD62D • 2ch • 500Kpps • Differential driver input • Transistor output (sink)
QD62E • 2ch • 200Kpps • 5/12/24 VDC input • Transistor output (source)

Interrupt Module

QI60 • 24 VDC input 16 points

Input Module

● Selectable high-speed/low-speed and input response time for DC input module.

Output Module

● Some types of transistor output modules include short-circuit protection.

[Partner product]
• GP-IB module

Refer to pages 35 to 36 for details on the partner product.

A wide range of application specific intelligent modules

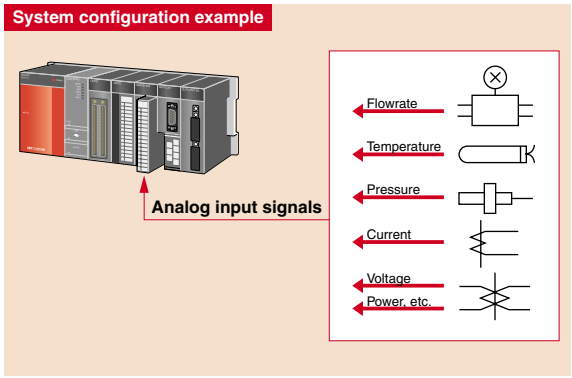
A range of analog modules ideal for process control applications.

Optimum isolated analog modules for process control

- **Channel-Isolated High Resolution A/D Module ····· Q64AD-GH**
- **Channel-Isolated High Resolution A/D Module (With Signal Conditioning function) ····· Q62AD-DGH**
- **Channel-Isolated High Resolution D/A module ····· Q62DA-FG**

The channel-isolated analog modules are specifically designed for process control applications by offering high accuracy conversion combined with high isolation voltage. Flowmeter, pressure gauge, etc can be directly connected to the analog input, and control valve to the analog output. Also, hardware and installation costs are substantially reduced because an external isolation amplifier is no longer required. Used together with a general purpose controller, a low cost process control solution is easily realized.

System configuration example

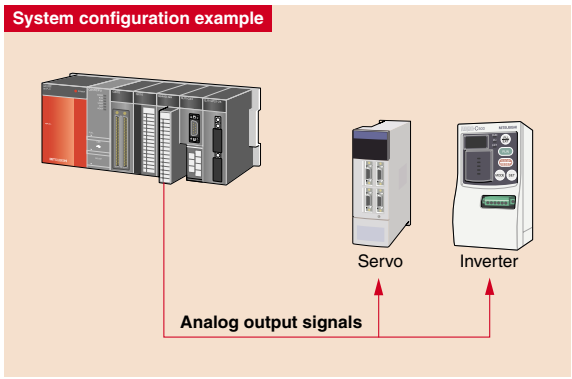


Analog modules for control applications that require high speed conversion.

- **A/D module ····· Q64AD, Q68ADV, Q68ADI**
- **D/A module ····· Q62DA, Q64DA, Q68DAV, Q68DAI**

A diverse range of analog modules are available for both A/D and D/A conversion. These high-speed conversion modules are suited for connection to various automation products, such as servo amplifiers and inverters, therefore providing a highly accurate solution.

System configuration example

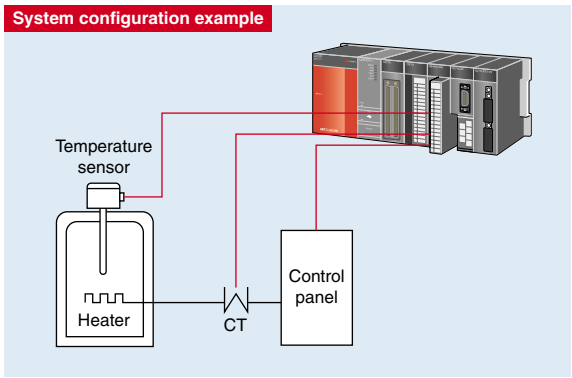


Temperature control modules that realize PID loop control.

- **Temperature control module ···Q64TCTT (BW), Q64TCRT (BW)**

Q Series offers a range of dedicated PID temperature loop controllers. These modules include their own PID control loops that act independently of the main CPUs. This allows a system to realize higher performance by diverting some control tasks from the main processor(s), freeing them up to take care of other control tasks. The temperature control modules offer compatibility with thermocouples and RTDs. A broken wire detection feature is also available.

System configuration example



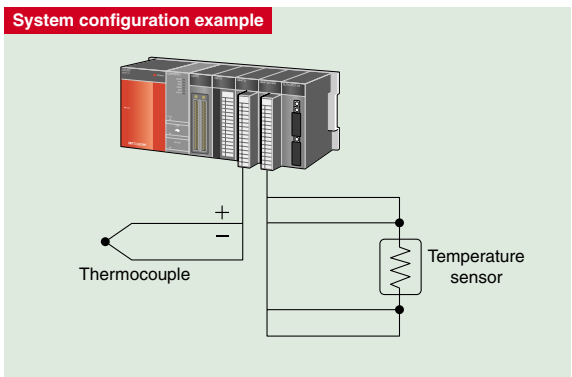
High accurate temperature input modules

- **Channel-isolated thermocouple input module ····· Q64TDV-GH**
  (Thermocouple input, micro voltage input)

  Q64TD
  (Thermocouple input)
- **Channel-isolated temperature-measuring resistor input module ····· Q64RD-G**
  (Platinum temperature-measuring resistor input, nickel temperature-measuring resistor input)
- **Temperature-measuring resistor input module ····· Q64RD**
  (Platinum temperature-measuring resistor input)

Realize temperature data input by connecting a thermocouple, and platinum temperature-measuring resistor or nickel temperature-measuring resistor. Initial settings and the automatic refresh settings can be set using GX Configurator -TI (Temperature input unit setting monitor tool), reducing the program.

System configuration example



Diverse range of motion control solutions offering compatibility with any drive system.

High speed and accurate positioning control

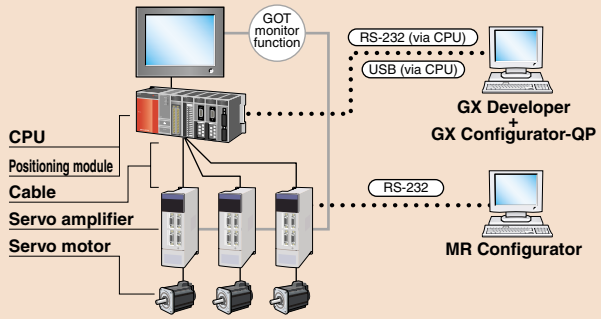
Various positioning control is supported including 2 to 4-axis linear interpolation, 2-axis circular interpolation, speed control, speed/position changeover, path control and constant speed control. Together with GX Configurator-QP setup software, setting the positioning data, monitoring, and debugging are easier. Also, Q Series leverages the benefits of SSCNET, Mitsubishi's high performance motion control network. This allows Mitsubishi's intelligent digital servos to be connected by a simple daisy chain cable, reducing costs and increasing performance.

◎ Pulse-train output type

- **Differential driver pulse-train output type ····· QD75D□**
- **Open collector pulse-train output type ····· QD75P□**

Both open collector and differential driver type positioning modules are available. The distance to the servo amplifier can be extended to 10m using the differential type, with a 1Mpps high-speed communication speed. High-speed, high-accuracy control are realized. (The command pulse with the open collector type is max. 200kpps.)

System configuration example

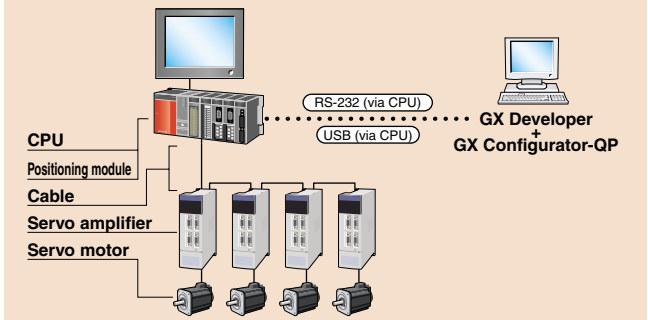


◎ SSCNET connection type

- **High-speed serial communication SSCNET connection type ····· QD75M□**

Using the SSCNET cable connection, ensures wire saving with a maximum 30m cable length. This type is also compatible with the absolute position system which establishes the OP with the data set type OPR method. Wiring for the proximity dog, etc., is no longer required.

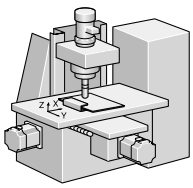
System configuration example



Application example 1 ‣ **X-Y table control**

[Function]

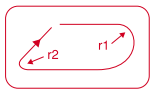
- 2-axis linear interpolation
- 3-axis linear interpolation
- 2-axis circular interpolation
- Constant speed pass control

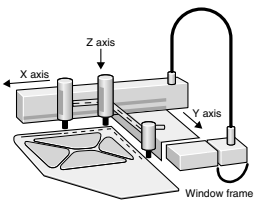


Application example 2 ‣ **Sealing**

[Function]

- Constant speed pass control
- Linear, circular interpolation
- High-speed, high-accuracy pass control





Ideal solution for simple multi-axis positioning systems

Satisfying requirements for simple positioning control applications, this module includes functions such as, positioning control, speed control, and variable positioning control. Here is the perfect positioning module for a multi-axis system that does not require complicated control.

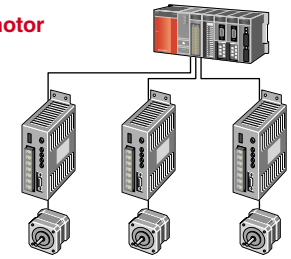
- **Open collector pulse train output type ····· QD70P□**

Control up to 4-axis/8-axis with one module.
Acceleration/deceleration is performed smoothly with very little speed fluctuations, therefore ideal for connecting to stepping motors.
High-speed processing is carried out at the start of position control.

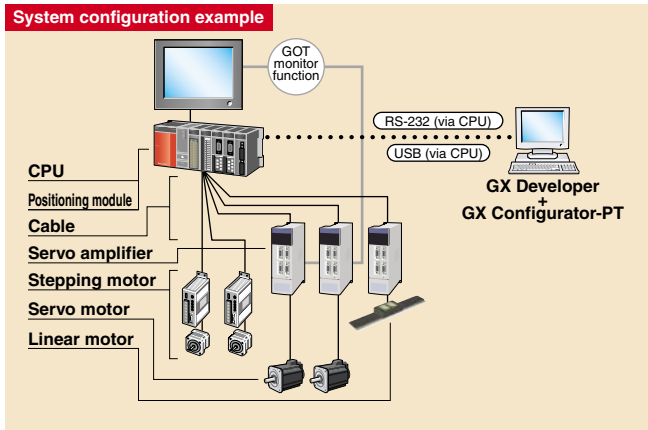
Starting conditions	Start process time
1-axis start	0.1ms
4-axis simultaneous start Note 2	0.2ms
8-axis simultaneous start Note 2	0.4ms

Note 2) This time applies when the start signals are simultaneously turned ON within one scan. The starting between axes is not delayed.

Application example ‣ **Stepping motor**



System configuration example



Software

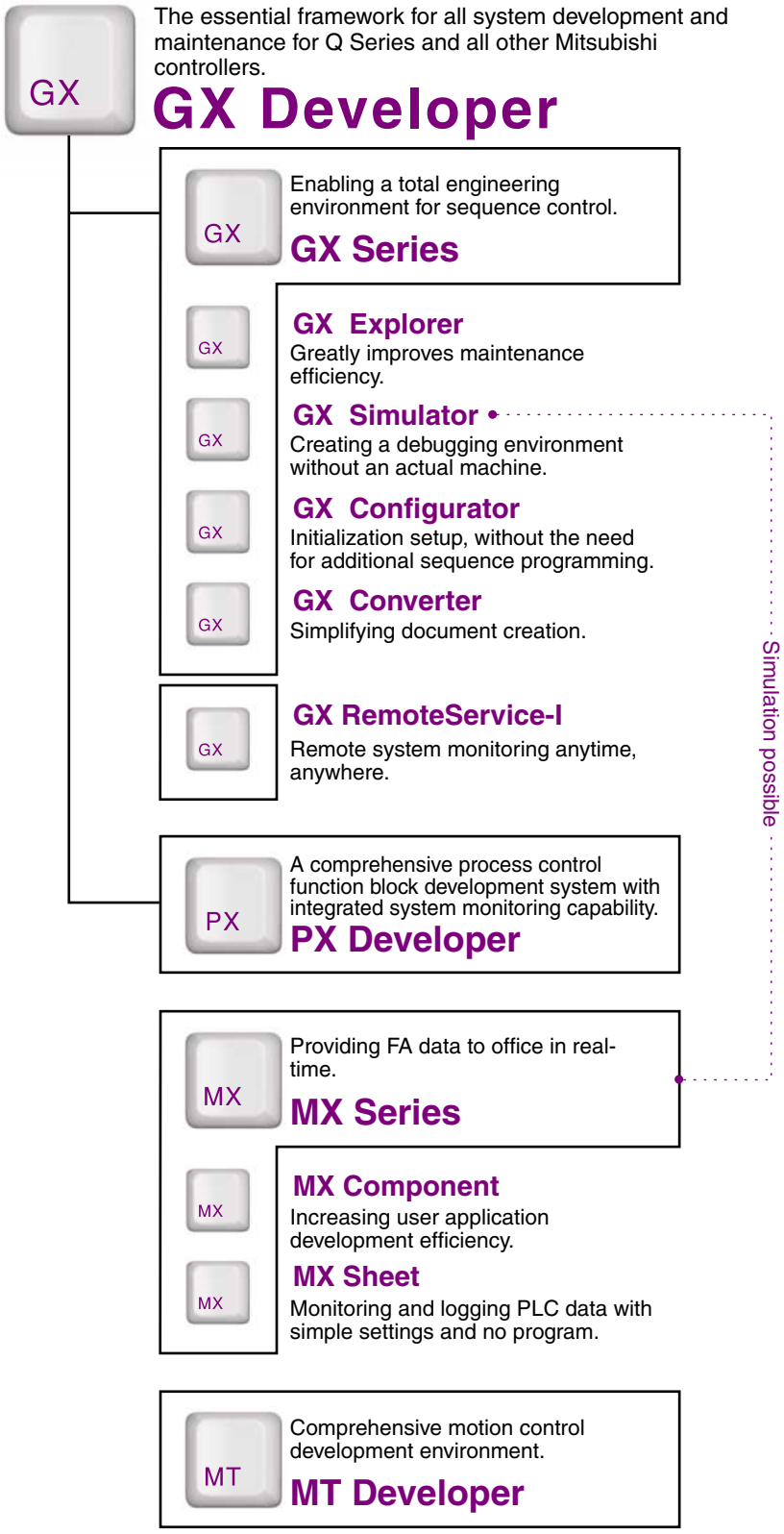
The integrated MELSOFT suite of software tools improves productivity, whether its for developing, debugging, operating, or maintaining Q series systems.

Automation has brought tremendous productivity benefits to industrial and commercial applications. With the MELSOFT software product family, Mitsubishi aims to bring similar productivity benefits to system designers, automation engineers, operators and maintenance personnel. The MELSOFT family is undergoing continuous evolution in order to meet the demands of new technologies and applications.

- GX Series
- PX Developer
- MX Series
- MT Developer

MELSOFT

The MELSOFT Family - Dramatically improving the efficiency of development and maintenance activities



Comfortable and Easy - That's the comprehensive engineering

GX Series Totally supporting sequence control engineering.

The basic framework for GX Series and PX Developer

GX Developer

Improving development efficiency by supporting a diverse range of programming languages

A comprehensive suite of development, debugging and maintenance tools contained in one easy to use, fully Windows® compliant software package. GX Developer fully supports all Mitsubishi controllers, and offers a range of tools unique to Q Series.

■ A variety of programming options

With GX Developer, Q Series supports a range of programming options, including ladder diagram (LD), sequential function chart (SFC), structured text (ST), function block (FB) and instruction list (IL).

■ System monitor

Online system configuration monitoring and error detection of each module reduces the time taken for restoring systems due to errors occurring.

■ Network parameter settings

Network set up, such as Ethernet, MELSECNET/H, and CC-Link are easily done from the built-in parameters of GX Developer. Therefore, no need to produce separate network set up sequence programs.

■ Network diagnostics

Built-in diagnostics tools for Ethernet, MELSECNET/H, CC-Link, and CC-Link/LT as standard in GX Developer. These tools greatly improve the task of debugging and maintenance of the network.

Ethernet diagnostics	Monitor the Ethernet parameters, such as the IP address, error history, status per connection, LED status and e-mail information, etc.
MELSECNET diagnostics	Monitor the MELSECNET/H network information, link information and update information. Diagnostics for network and loop tests are also included.
CC-Link diagnostics	Monitor the local station's data link status, operation status and link scan time, etc.
CC-Link/LT diagnostics	Monitor the local station's data link status and operation status, etc.

GX Simulator

System simulation for offline development

GX Simulator acts as a controller within your PC that duplicates the actual hardware your application will run on. It allows you to develop and verify the operation of your programs without needing actual hardware. Hence development of new systems can be carried out independently of actual plant equipment, and operation can be assured before commissioning on the shop floor. Operation is transparent, and duplicates the operation of the actual controller. GX Simulator also includes tools for analysis of system operation, such as a built in chart recorder for capturing system events, etc.

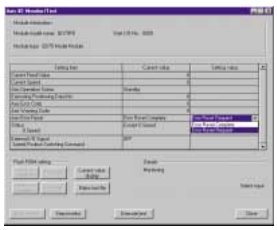
GX Configurator / GX Converter

Add-on software to enhance GX Developer functionality

GX Configurator

Configure and monitor without a program

This software sets and monitors the data for various intelligent function modules. Initialization can be carried out without a program by adding this onto GX Developer.



GX Converter

Simplifying document creation

GX Converter data conversion software package for Windows is a software designed to convert other format data (text format data, CSV format data) to GX Developer format data (instruction list, device comment). It allows CAD data to be utilized on GX Developer for equipment design or GX Developer data to be utilized for design on CAD, increasing design efficiency.

GX Explorer

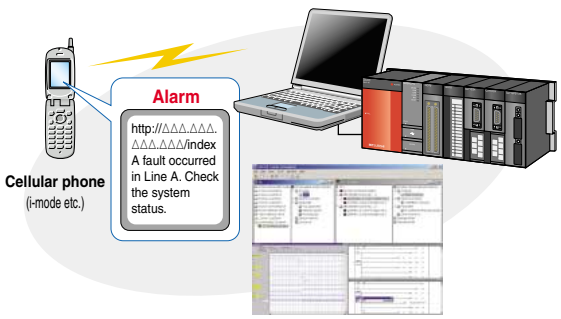
Centralized, remote maintenance

GX Explorer allows multiple networked systems to be monitored and remotely maintained from a central location, using an intuitive Windows™ Explorer™ like interface. Network structures are represented, and programs can be uploaded and downloaded across the network links. Full access to all controller diagnostics is also available.

GX RemoteService-I

Remote maintenance made easy, incorporated into MELSOFT

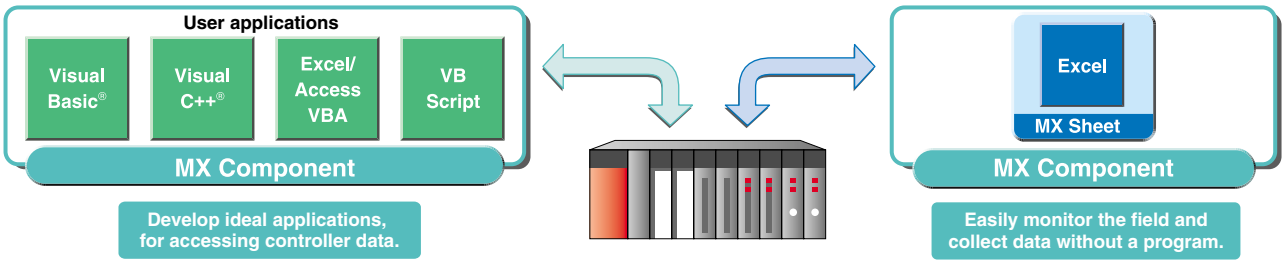
When used together with GX Explorer, the various GX Explorer maintenance functions can be used via the internet or intranet. Therefore, used on a Windows® PC or the PC CPU, remote maintenance is realized easily and efficiently, providing another useful tool specific for the Q series.



environment provided by MELSOFT.

MX Series Access to shop floor information in real-time.

MX Series provides a suite of middleware tools that abstract the different Mitsubishi hardware level protocols into a form that is easily integrated into third party applications. This allows you to build your own applications to work with the shop floor hardware without needing detailed knowledge of the internal functions of the controllers themselves. MX Series supports a variety of communication methods for maximum flexibility.



MX Component

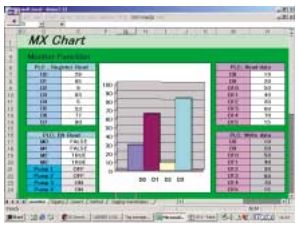
ActiveX® based communications between a PC and the controller.

MX Component's ActiveX® based library frees the system programmer from having to consider low-level hardware based protocol communication issues when designing third party applications to interface with shop floor equipment. This shortens the design cycle, as development can leverage standard tools and concentrate on the system design itself.

MX Sheet

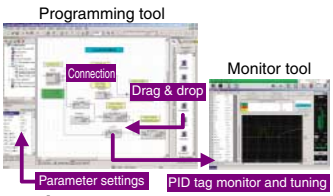
Collect data without programs.

A fully featured add-on software that easily integrates into Microsoft™ Excel™. Using together with this software, simple logging, monitoring, etc., functions can be realized as an alternative for a costly data acquisition software.



PX Developer A comprehensive process control system design tool with control and monitoring capabilities

PX Developer is dedicated to the Q process control CPUs. It provides a function block programming environment that meets the demands of process related applications. Built-in monitoring tools allow real time loop tuning and control.



■ Standard FB and dedicated process functions

- All Q Series process control related functions are represented by function blocks
- Custom FB can be created from standard blocks
- FB for accessing analog modules and input/output modules

■ Reuse program code on future projects

FBs make all programs modular, allowing immediate reuse in future projects requiring similar capabilities. This allows development time to be progressively shortened through the design lifetime.

■ Integration with sequence control programs

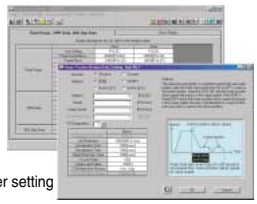
Using label based programming allows data from process control programs to be easily integrated into sequence control programs, further enhancing the integration of multiple processor systems.

■ Comprehensive system monitoring and control capability

The PX Developer Monitor Tool provides in-depth capabilities to provide real-time monitoring of loop functions combined with auto-tuning, cascade, automatic, and manual loop control options.

MT Developer Comprehensively supporting system structuring based on Motion controller.

A fully integrated program design software for the motion controller. This software includes many tools imperative for configuring and maintaining motion control systems, improving the overall design system.



Servo parameter setting

■ Application specific programming environment

A diverse range of main OS software, ensures a flexible programming environment corresponding to the specific application requirements.

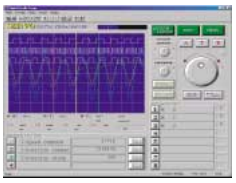
Motion SFC (Sequential Function Chart) format programming.

■ System test and debug

Implementation time can be reduced with extensive test and debugging tools built-in.

■ Maintenance and operation

Monitoring and diagnostics are further enhanced with the built-in parameter monitoring function, SFC monitoring and digital oscilloscope, errors can be resolved quickly and efficiently.



Digital oscilloscope

■ Document creation

The Motion controller's various parameters and programs can be converted into Word or Excel files, providing an efficient method of producing documentation and setup guide information for future use.

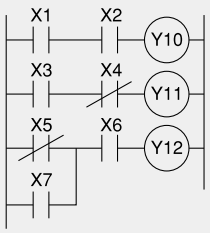
The ideal programming technique for the required application

Sequence Program Environment

Q Series supports all major sequence control programming methods in use today. These include Ladder Diagram (LD), Instruction List (IL), Sequential Function Chart (SFC), Function Blocks (FB) and Structured Text (ST). Additionally, the high performance Q Series sequence CPUs allow multiple programs to co-exist in the processor, and can be executed in variable ways, further improving the performance of the controller.

Manual operation program

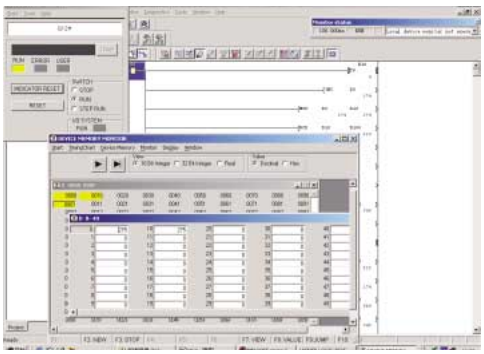
(Ladder (circuit representation))



Communication processing program

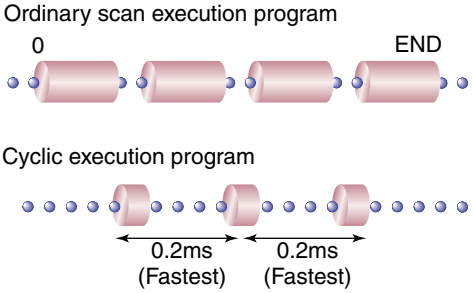
(Ladder (list representation))

```
LD X50
MOVP K1 D0
MOVP K4 D3
MOVP H3412 D10
MOVP HBC5A D11
MOVP HF0DE D12
MOVP H0A0D D13
GP.BIDOUT U8 DO D10 M0
```



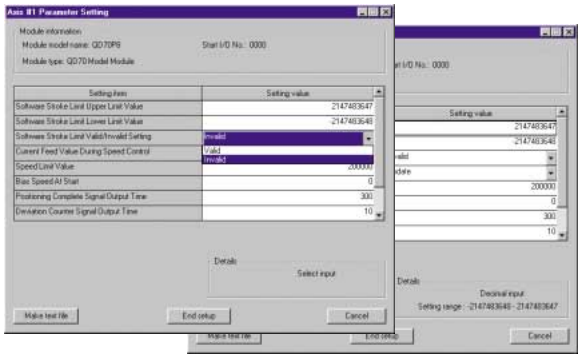
Fixed Scan Program

Q Series offers the ability to fix the program execution scan at a predetermined interval between 0.5ms-60s (High permance model QCPU and process CPU). This allows the determinism of a system's execution to be improved for applications where execution timing is critical. To further improve response to brief events, a 0.2ms interrupt function is also available.



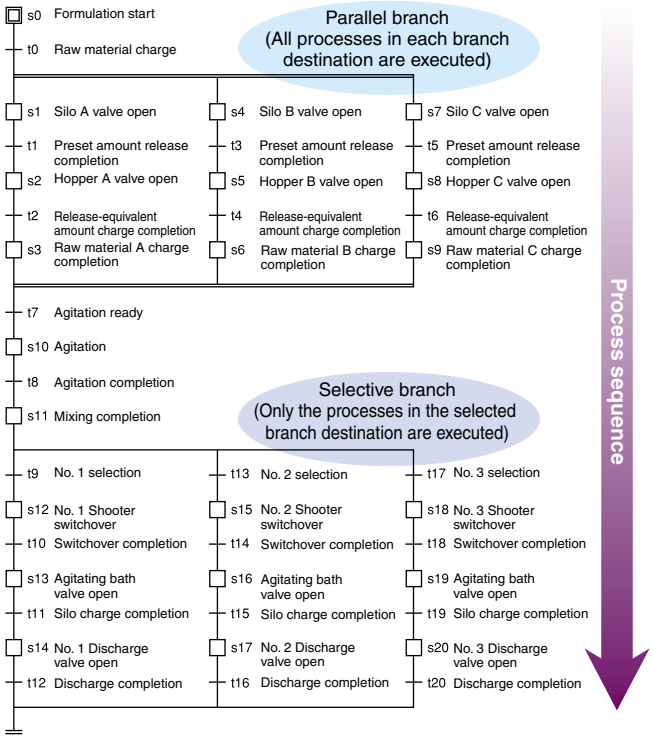
Program-free Initial Settings

GX Configurator frees the system designer from having to waste engineering time on writing and debugging code just to configure the controller's special function modules. All modules such as analog, communications and motion control have GX Configurator tools associated with them that reduce configuration to a simple menu based system. Further, the automatic refresh capability of the Q Series insures that using GX Configurator to monitor system configuration during maintenance always shows real time system data.



Sequential Function Chart Programming

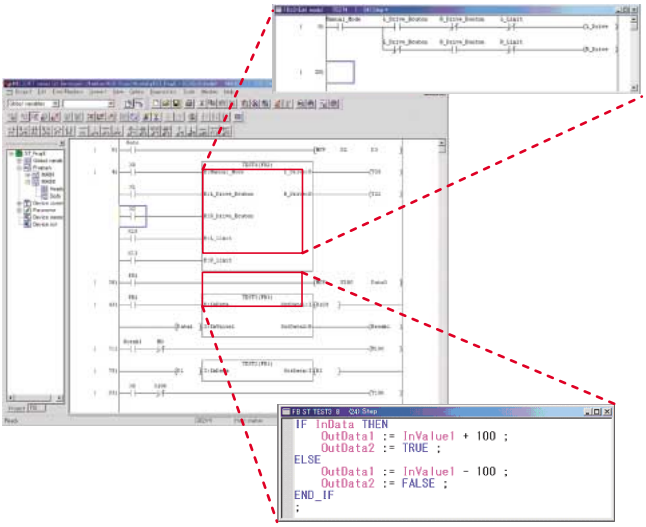
Sequential Function Chart (SFC) is an industry standard programming method that improves the readability of a program via a graphical representation similar to a flowchart. Q Series fully supports SFC, offering you the chance to simplify the organization of your programming by using multiple program states to control and sequence the operation of your application. During maintenance, SFC can also be used to follow the operation of a system graphically, improving the productivity of maintenance personnel.


s0 Formulation start
t0 Raw material charge
Parallel branch
(All processes in each branch destination are executed)
s1 Silo A valve open
t1 Preset amount release completion
s2 Hopper A valve open
t2 Release-equivalent amount charge completion
s3 Raw material A charge completion
s4 Silo B valve open
t3 Preset amount release completion
s5 Hopper B valve open
t4 Release-equivalent amount charge completion
s6 Raw material B charge completion
s7 Silo C valve open
t5 Preset amount release completion
s8 Hopper C valve open
t6 Release-equivalent amount charge completion
s9 Raw material C charge completion
t7 Agitation ready
s10 Agitation
t8 Agitation completion
s11 Mixing completion
Selective branch
(Only the processes in the selected branch destination are executed)
t9 No. 1 selection
s12 No. 1 Shooter switchover
t10 Switchover completion
s13 Agitating bath valve open
t11 Silo charge completion
s14 No. 1 Discharge valve open
t12 Discharge completion
t13 No. 2 selection
s15 No. 2 Shooter switchover
t14 Switchover completion
s16 Agitating bath valve open
t15 Silo charge completion
s17 No. 2 Discharge valve open
t16 Discharge completion
t17 No. 3 selection
s18 No. 3 Shooter switchover
t18 Switchover completion
s19 Agitating bath valve open
t19 Silo charge completion
s20 No. 3 Discharge valve open
t20 Discharge completion
Process sequence

Function Blocks (FB)

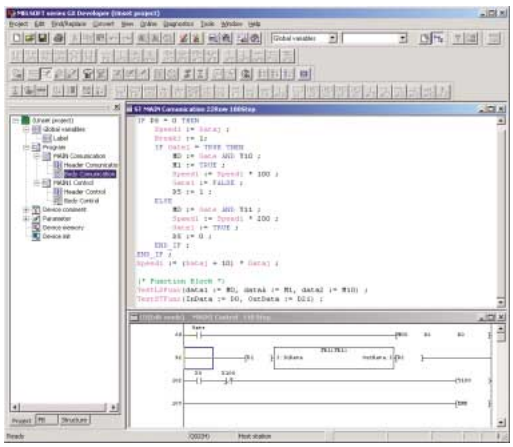
Function blocks allow sections of programs to be represented as a single function block.

- Complex ladder programs can be made easier to read, simplifying debugging and troubleshooting on the shop floor.
- Program code can easily be reused by cutting and pasting function blocks.
- Use ladder diagram or structured text to create function block code.



Structured Text (ST)

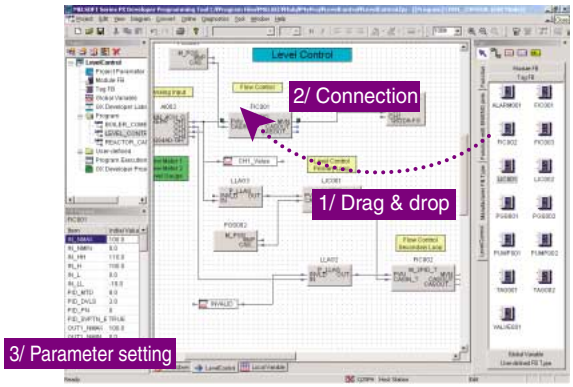
Structured text allows the Q Series to offer a new dimension in automation programming. ST breaks with the traditional methods of sequence programming by using a format similar to conventional computer programming languages. This offers the benefit of giving programmers a tool to describe processes that are not readily described using other languages. Additionally, ST offers newer programmers who are not familiar with automation in general an immediate opportunity to become productive based on their existing experience.



Process Control Function Block Diagram Programming

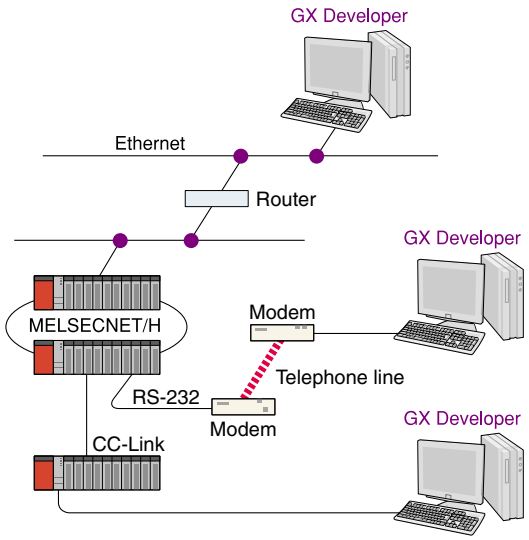
Q Series Process Control Function Block programs can be created by PX Developer. This allows easy creation and editing of loop control programs simply by dragging and dropping the required function blocks and connecting them together in the desired way. Loop parameters and other essential process properties can be easily configured. Process control programs can share data with sequence control program if label programming is used.

*GX Developer Ver. 7.20W or higher must be installed in the same personal computer to run PX Developer.

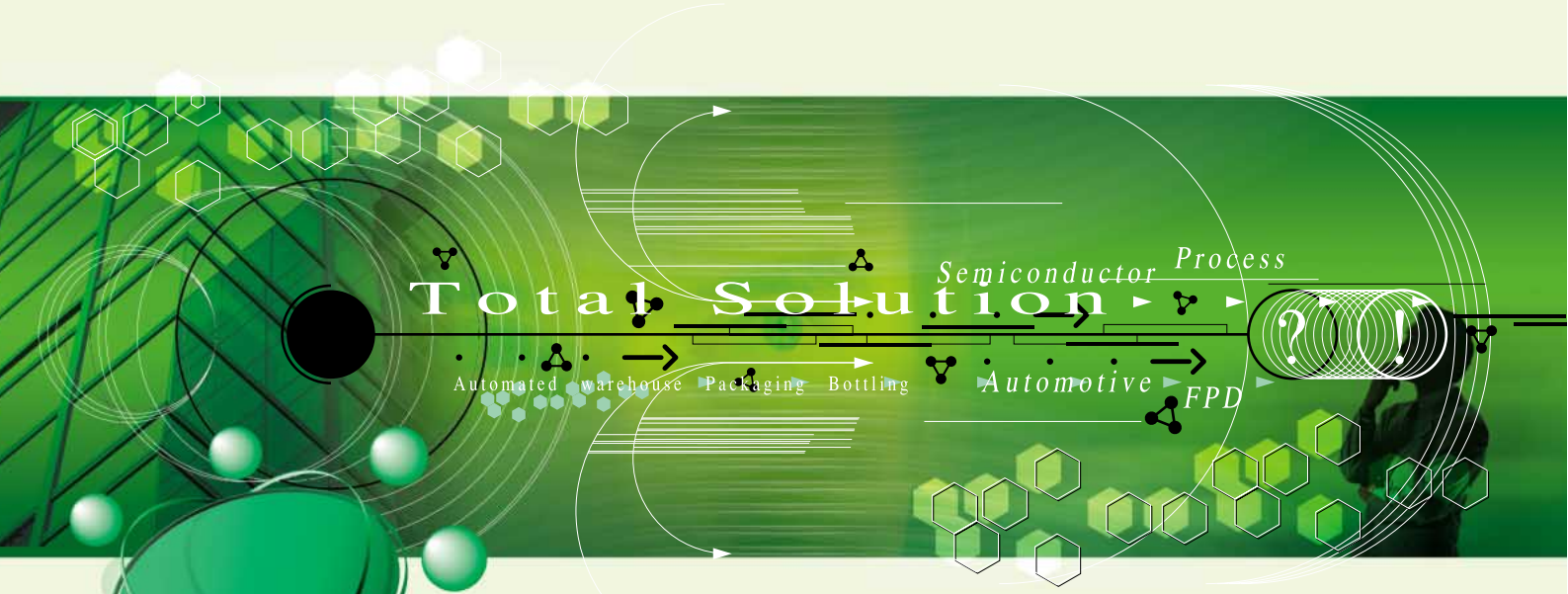


Remote Programming

GX Developer fully supports the remote maintenance of distant installations, whether via dial-up access or through the Internet to systems on the other side of the world. Once connected to a system, and security requirements are met, this type of connection allows full access to all aspects of the Q Series in the same way as a local connection via a programming cable.



Solution



Realizing solutions for a diverse range of applications

A vast range of solutions available tackling the various challenges required in present and future applications.

The general trend of the manufacturing industry is requiring greater productivity with minimum cost, but still maintaining very high production quality. Such as the LCD and semiconductor industries, which requires larger sizes and greater diameter wafer sizes, whilst keeping the cost to a minimum. These trends are recognized and understood by Mitsubishi Electric, that is why the solutions provided are more than capable of reaching the stringent requirements. Therefore, together with Q series and other Mitsubishi Electric automation products, productivity and quality can be kept high, while keeping down costs.

- Semiconductor
- LCD
- Process Control
- Automotive
- Material Handling
- Food & Beverage
- Processing Plants, etc.

Working with the customer to provide the right solution

Semiconductor, LCD

·LED material packing machine ·PCB manufacturing line ·LCD manufacturing line ·Molding machine ·Mask device ·Spin coater ·Washer ·Inspection device ·Chemical supply unit ·Hard disk manufacturing ·Bump plating device ·CMP device ·Hard disk polisher ·Wafer polisher ·Exposure device ·Pure water processing device ·Splattering device ·Coating device ·CD inspection device ·Liquid crystal injection device ·Bonding

Process Control

·Food & Beverage (brewing, sterilization, drying) ·Chemicals (polymerization, distillation, drying) ·Fine chemicals (blending, mixing) ·Steel metals (ingredient mixing, sintering, reduction, separation) ·Non-ferrous metals (electric furnace, melting furnace) ·Water and sewage (dehydration, desulfurization, chemical injection) ·Paper manufacturing (paper machine) ·Environment (garbage incineration, ash treatment, drain, sludge treatment, pulverization, fuel cells) ·Semiconductors (heating furnace, diffusion furnace, ion injection) ·Ships (boiler) ·Plastic/rubber (winding) ·Buildings (air-conditioning, drainage, boiler)

Automotive

·Painting system ·Production specifications instruction system ·Engine conveyance device ·Vehicle assembly line ·Welding process ·Electric furnace heating device for crankshafts ·Disk brake machining ·Screw tightening error prevention system ·Automotive electronic part manufacturing

Material Handling

·Parcel sorting device ·PET bottle manufacturing and transfer line ·Household appliance distribution warehouse transfer line ·CRT transfer ·Woodworking machine conveyor ·NC loader ·Printed material transfer system ·Airport baggage handling system

Electric Devices

·Refrigerator manufacturing line ·Air conditioner manufacturing line ·Inverter manufacturing line

Chemicals

·Detergent packing line ·Rubber measurement ·Tire manufacturing device ·Synthetic leather manufacturing line ·Pre-processing for ceramics ·Polishing material measurement ·Concrete automatic measuring system

Food & Beverage

·Soft drink manufacturing line ·Food packaging machine

Printing

·Postcard printer ·Rotary press (offset/newspaper) ·Printer manufacturing line

Processing Plants

·Hydrogen booster ·Cardboard production facility ·Concrete manufacturing, filling device for tunnels

Press/moulding Machines

·Injection moulding machine-Extrusion machine

Buildings, Factories, Utility Control

·Building air conditioning system ·Power monitoring system ·Building security system-Building management system

Pharmaceutical

·Tablet manufacturing system

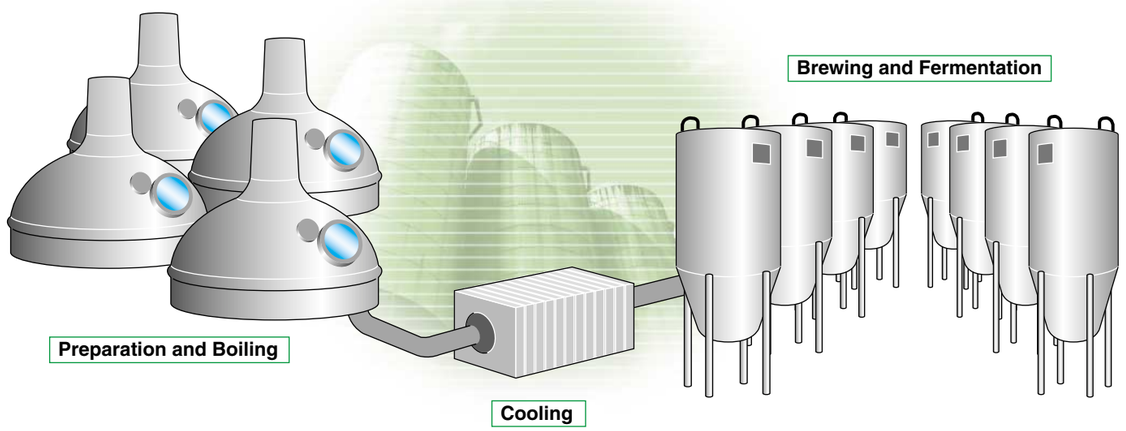
Various Devices and Systems

·Bearing manufacture ·Train car wheel inspection ·Microwave heating system

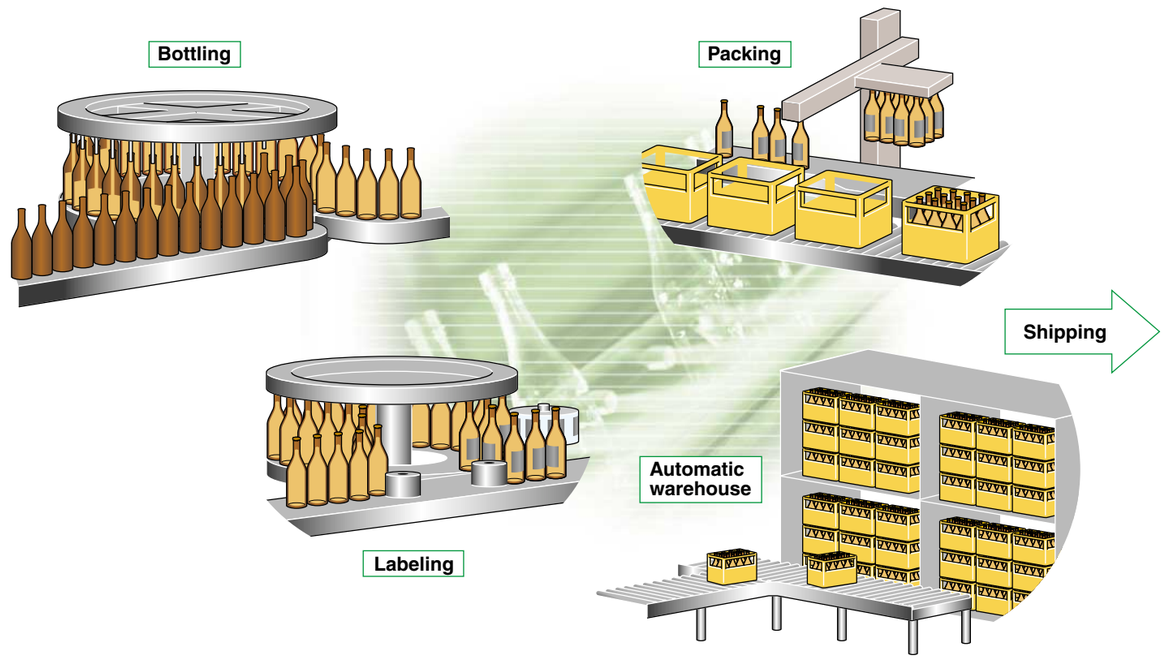
Providing the right solution for various applications

Beer brewery solution example

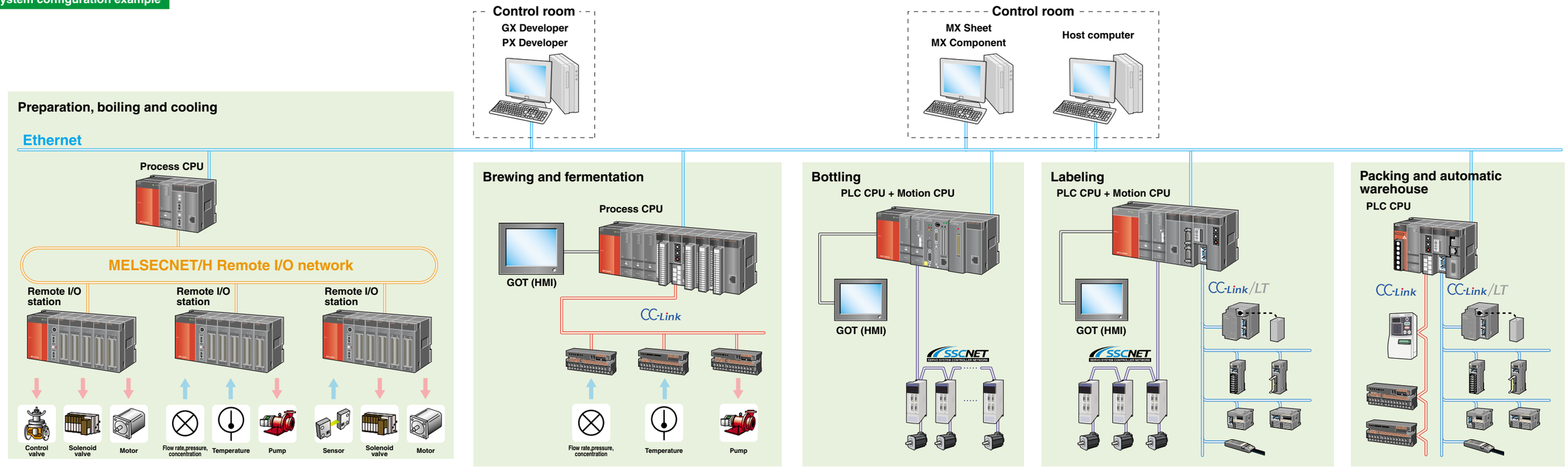
Combining the Q series with other Mitsubishi Electric automation products to offer a powerful intelligent solution for your needs.



Temperature, flow rate and fluid level control



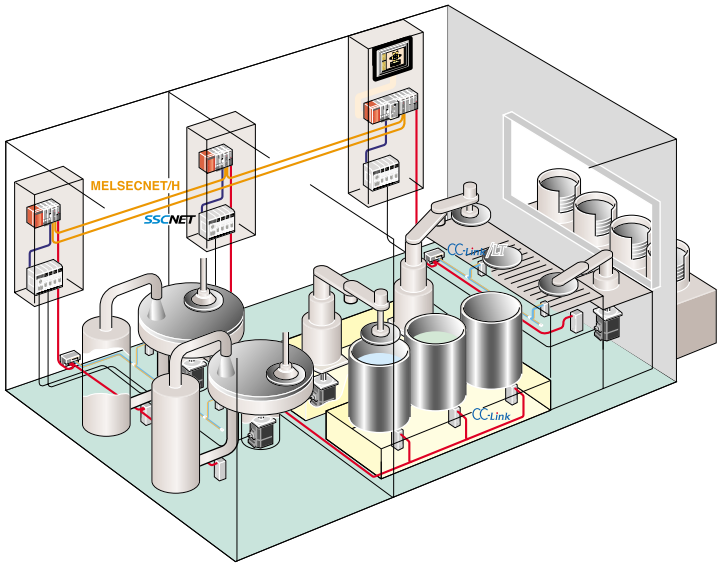
System configuration example



Providing solutions specific to IT industry

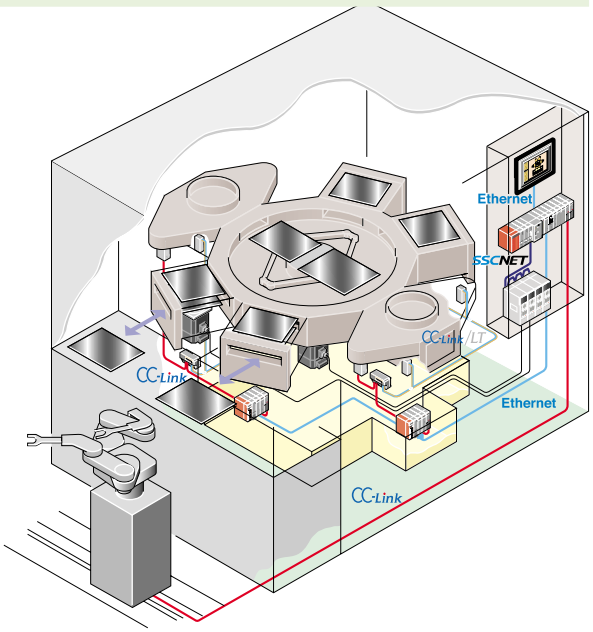
Semiconductor (CMP system) solution example

Following the semiconductor industry's trend to 300mm technology

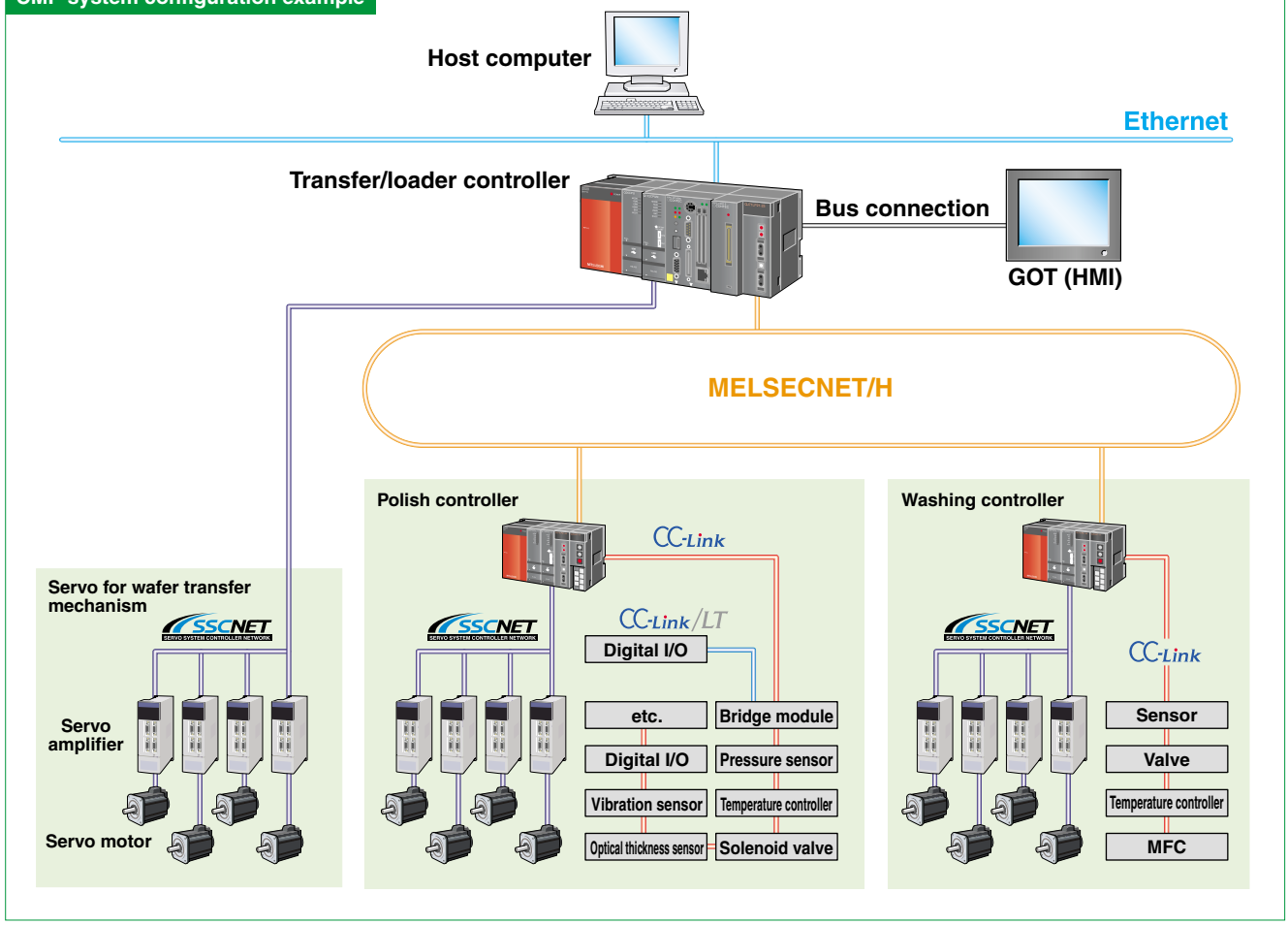


LCD (CVD system) solution example

Leading the manufacturing trends of LCD panels which continue to increase in size.



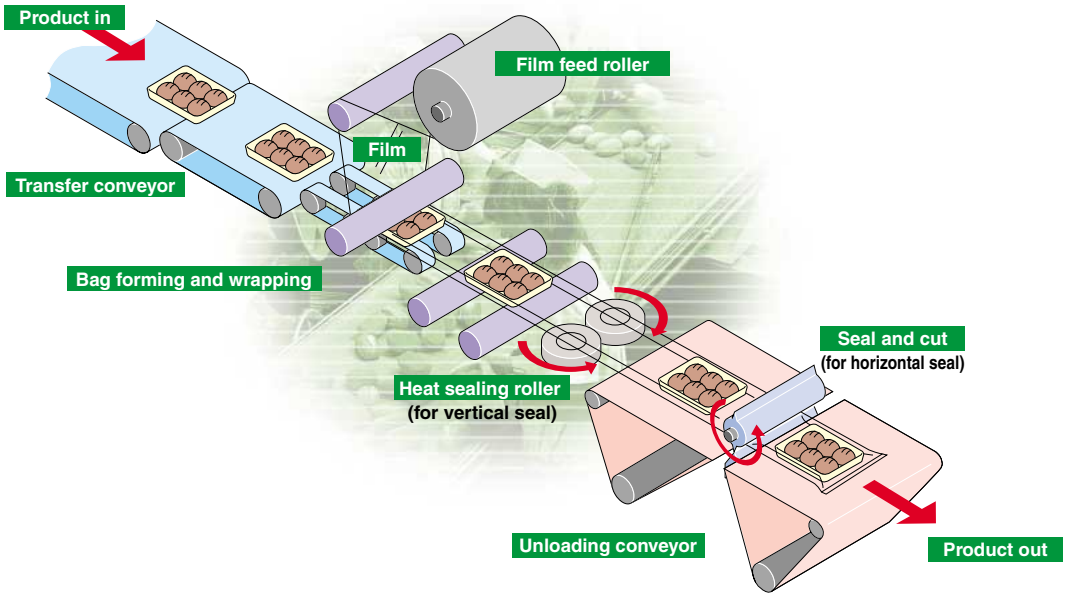
CMP system configuration example



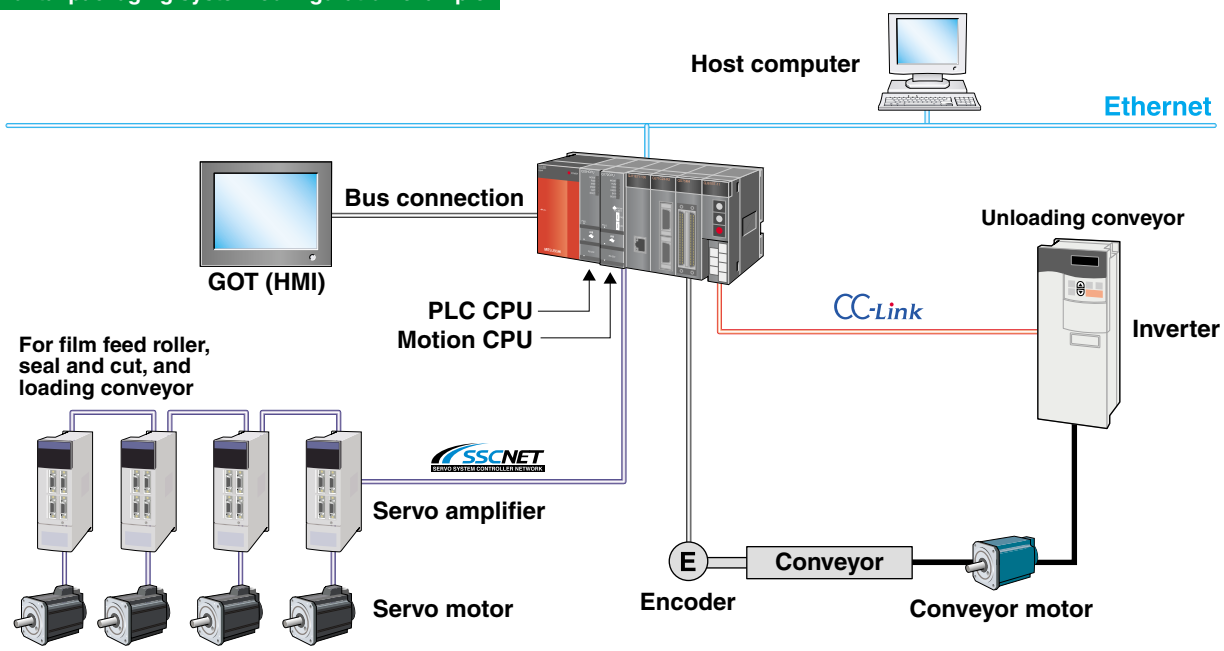
Powerfully supporting packaging solutions with accurate motion control

Horizontal packaging solution example

High feed rates with superior accuracy are realized.



Horizontal packaging system configuration example



CPU module performance specifications

PLC CPU

Item		Basic Model			High Performance Model				
		Q00JCPU	Q00CPU	Q01CPU	Q02CPU	Q02HCPU	Q06HCPU	Q12HCPU	Q25HCPU
Control method		Sequence program control method							
I/O control mode		Refresh							
Programming language (Language dedicated to sequence control)		* Relay symbol language (ladder) * Logic symbolic language (list) * MELSAP3 (SFC), MELSAP-L * Structured text (ST)			* Relay symbol language (ladder) * Logic symbolic language (list) * MELSAP3 (SFC), MELSAP-L * Structured text (ST)				
Processing speed (Sequence instruction) (Note 1)	LD instruction	200ns	160ns	100ns	79ns	34ns			
	MOV instruction	700s	560ns	350ns	237ns	102ns			
	PC MIX value (Instruction/μs) (Note 2)	1.6	2.0	2.7	4.4	10.3			
	Floating-point addition	65.5μs	60.5μs	49.5μs	1815ns	782ns			
Total number of instructions (Note 3)		318	327		381				
Calculation (floating point calculation) instruction		Available			Available				
Character string processing instruction		Available (Note 6)			Available				
PID instruction		Available			Available				
Special function instruction (Trigonometric function, square root, exponential operation, etc.)		Available			Available				
Constant scan (Function to make scan time constant)		1 to 2000ms (set in 1ms units)			0.5 to 2000ms (set in 0.5ms units)				
Program capacity		8k step		14k step	28k step		60k step	124k step	252k step
Number of I/O device points [X/Y]		2048 points			8192 points				
Number of I/O points [X/Y]		256 points	1024 points		4096 points				
Internal relay [M]	(Note 4)	8192 points			8192 points				
Latch relay [L]		2048 points			8192 points				
Link relay [B]		2048 points			8192 points				
Timer [T]		512 points			2048 points				
Retentive timer [ST]		0			0				
Counter [C]		512 points			1024 points				
Data register [D]		11136 points			12288 points				
Link register [W]		2048 points			8192 points				
Annunciator [F]		1024 points			2048 points				
Edge relay [V]		1024 points			2048 points				
File register [R, ZR]		No	65536 points		32768 points (Note 5)	65536 points (Note 5)		131072 points (Note 5)	
Special link relay [SB]		1024 points			2048 points				
Special link register [SW]		1024 points			2048 points				
Step relay [S]		2048 points			8192 points				
Index register [Z]		10 points			16 points				
Pointer [P]		300 points			4096 points				
Interrupt pointer [I]		128 points			256 points				
Special relay [SM]		1024 points			2048 points				
Special register [SD]		1024 points			2048 points				
Function input [FX]		16 points			16 points				
Function output [FY]		16 points			16 points				
Function register [FD]		5 points			5 points				
Local device		None			Available				
Device initial values		Available			Available				

Note 1) The processing time will not be delayed if the devices are indexed.
Note 2) The PC MIX value is the average number of instructions, such as basic instructions or data processing instructions, which can be executed in 1μs. The processing speed will rise as the value increases.
Note 3) The intelligent function module's dedicated instructions are not included.
Note 4) Indicates the number of points in the default state. This can be changed with the parameters.
Note 5) Indicates the number of points when using the built-in memory (standard RAM).
This can be expanded with the SRAM card and Flash card. (Writing from the program is not possible when using the Flash card.)
Up to 1041408 points can be used when using the SRAM card.
Note 6) The character strings can be used only with the character string data transfer instruction ($MOV).

Process CPU

Item		Process CPU	
		Q12PHCPU	Q25PHCPU
Control method		Sequence program control method	
I/O control mode		Refresh	
Programming language	Language dedicated to sequence control	* Relay symbol language (ladder) * Logic symbolic language (list) * MELSAP3 (SFC), MELSAP-L * Structured text (ST)	
	Language for process control	FBD for process control	
Processing speed (Sequence instruction) (Note 1)	LD instruction	34ns	
	MOV instruction	102ns	
	PC MIX value (Instruction/μs) (Note 2)	10.3	
	Floating-point addition	782ns	
Total number of instructions (note 3)		415	
Calculation (floating point calculation) instruction		Available	
Character string processing instruction		Available	
Processing instruction		Available	
Special function instruction (Trigonometric function, square root, exponential operation, etc.)		Available	
Constant scan (Function to make scan time constant)		0.5 to 2000ms (set in 0.5ms units)	
Program capacity		124k step	252k step
Loop control specifications	Instructions for process control	52 types	
	Number of control loops	No control (Note 4)	
	Control cycle	10ms and higher control loop Variable per loop	
	Main functions	2-degree of freedom PID control, cascade control, auto tuning function, feed forward control	
Number of I/O device points [X/Y]		8192 points	
Number of I/O points [X/Y]		4096 points	
Internal relay [M]	(Note 5)	8192 points	
Latch relay [L]		8192 points	
Link relay [B]		8192 points	
Timer [T]		2048 points	
Retentive timer [ST]		0 point	
Counter [C]		1024 points	
Data register [D]		12288 points	
Link register [W]		8192 points	
Annunciator [F]		2048 points	
Edge relay [V]		2048 points	
File register [R, ZR]		131072 points (Note 6)	
Special link relay [SB]		2048 points	
Special link register [SW]		2048 points	
Step relay [S]		8192 points	
Index register [Z]		16 points	
Pointer [P]		4096 points	
Interrupt pointer [I]		256 points	
Special relay [SM]		2048 points	
Special register [SD]		2048 points	
Function input [FX]		16 points	
Function output [FY]		16 points	
Function register [FD]		5 points	
Local device		Available	
Device default values		Available	

Note 1) The processing time will not be delayed if the devices are indexed.
Note 2) The PC MIX value is the average number of instructions, such as basic instructions or data processing instructions, which can be executed in 1μs. The processing speed will rise as the value increases.
Note 3) The intelligent function module's dedicated instructions are not included.
Note 4) The number of control loops is limited by the combination of the device memory capacity (using 128 words/loop) and control cycle.
Note 5) Indicates the number of points in the default state. This can be changed with the parameters.
Note 6) Indicates the number of points when using the built-in memory (standard RAM).
This can be expanded with the SRAM card and Flash card. (Writing from the program is not possible when using the Flash card.)
Up to 1041408 points can be used when using the SRAM card.

Motion CPU

Item		Q173CPUN	Q172CPUN
Number of control axes		32 axes	8 axes
(Note 1) Operation cycle (default)	SV13	0.88ms : 1 to 8 axes 1.77ms : 9 to 16 axes 3.55ms : 17 to 32 axes	0.88ms : 1 to 8 axes
	SV22	0.88ms : 1 to 4 axes 1.77ms : 5 to 12 axes 3.55ms : 13 to 24 axes 7.11ms : 25 to 32 axes	0.88ms : 1 to 4 axes 1.77ms : 5 to 8 axes
Interpolation functions		Linear interpolation (UP to 4 axes), Circular interpolation (2 axes), Helical interpolation (3 axes)	
Control modes		PTP (Point To Point), Speed control, Speed/position switching control, Fixed-pitch feed, Constant-speed control, Position follow-up control, Speed switching control, High-speed oscillation control, Synchronous control (SV22)	
Acceleration/deceleration control		Automatic trapezoidal acceleration/deceleration, S-curve acceleration/deceleration	
Compensation function		Backlash compensation, Electronic gear	
Programming language		Motion SFC, Dedicated instruction, Mechanical support language (SV22)	
Servo program (dedicated instruction) capacity		14k steps	
Number of positioning points		3200 points (positioning data can be set indirectly)	
Programming tool		IBM PC/AT	
Peripheral I/F		USB/RS-232/SSCNET	
Home postion return function		Proximity dog type (2 types), Count type (3 types), Data set type (2 types), Dog cradle type, Stopper type (2 types), Limit switch combined type	
JOG operation function		Provided	
Manual pulse generator operation function		Possible to connect 3 modules	
Synchronous encoder operation function		Possible to connect 12 modules (SV22 use)	Possible to connect 8 modules (SV22 use)
M-code function		M-code output function provided, M-code completion wait function provided	
Limit switch output function		Number of output points : 32 points Watch data: Motion control data/Word device	
Absolute position system		Made compatible by setting battery to servo amplifier (Possible to select the absolute/Incremental data method for each axis)	
Number of Motion related modules		Q172LX : 4 modules Q172EX : 6 modules Q173PX : 4 modules (Note 2)	Q172LX : 1 module Q172EX : 4 modules Q173PX : 3 modules (Note 2)
Program capacity	Code total (Motion SFC diagram + operation control + Transition)	287kbyte	
	Text total (operation control + Transition)	224kbyte	
Number of I/O (X/Y) points		8192 points	
Number of real I/O (PX/PY) points		256 points	
Number of devices	Internal relays (M)	Total (M+L): 8192 points	
	Latch relays (L)		
	Link relays (B)	8192 points	
	Annunciators (F)	2048 points	
	Data registers (D)	8192 points	
	Link registers (W)	8192 points	
	Motion registers (#)	8192 points	
	Coasting timers (FT)	1point (888μs)	

Note 1) The operation cycle is 1.77ms or more when using the MR-H□BN.
Note 2) The incremental synchronous encoder use (SV22). When connecting the manual pulse generator, you can use only one module.

GENERAL SPECIFICATIONS

General specifications indicate the environmental specifications in which this product can be installed and operated. Unless otherwise specified, the general specifications apply to all products of the Q series. Install and operate the Q series products in the environment indicated in the general specifications.

Item	Specifications				
Operating ambient temperature	0 to 55ºC (Note 1)				
Storage ambient temperature	-25 to 75ºC (Note 1) (Note 2)				
Operating ambient humidity	IEC (EN) 61131-2 Level RH-2 (5 to 95%RH: non-condensing) (Note 3)				
Storage ambient humidity	IEC (EN) 61131-2 Level RH-2 (5 to 95%RH: non-condensing) (Note 3)				
Vibration resistance	Conforming to IEC 61131-2	Under intermittent vibration	Sweep count		Sweep count
		Frequency	Acceleration	Amplitude	10 times each in X, Y, Z
		10 to 57Hz	—	0.075mm	directions (for 80 min.)
		57 to 150Hz	9.8m/s^2	—	
		Under continuous vibration			
		Frequency	Acceleration	Amplitude	
		10 to 57Hz	—	0.035mm	
		57 to 150Hz	4.9m/s^2	—	
Shock resistance	Conforming to IEC (EN) 61131-2 147 m/s^2, 3 times in each of 3 directions X, Y, Z				
Operating atmosphere	No corrosive gases				
Operating altitude	IEC (EN) 61131-2 2000m max. (Note 4)				
Installation location	Inside control box				
Overvoltage category	IEC (EN) 61131-2 (Category Ⅱ or less) (Note 5)				
Pollution level	IEC (EN) 61131-2 Pollution level 2 or less. (Note 6)				

Note 1) The operating/storage ambient temperature satisfies the requirements beyond the requirements in IEC (EN) 61131-2.
Note 2) When used with the AnS series modules, the Q series PLC should be stored at -20 to 75°C.
Note 3) When used with the AnS series modules, the Q series PLC should be operated within 10 to 90%RH.
Note 4) The PLC cannot be used under pressure higher than the atmospheric pressure of altitude 0m. Doing so can cause a failure.
Note 5) This indicates the section of the power supply to which the equipment is assumed to be connected between the public electrical power distribution network and the machinery within premises. Category Ⅱ applies to equipment for which electrical power is supplied from fixed facilities. The surge voltage withstand level for up to the rated voltage of 300V is 2500V.
Note 6) This index indicates the degree to which conductive material is generated in the environment where the equipment is used. In pollution level 2, only non-conductive pollution occurs but temporary conductivity may be produced due to condensing.

INCREASED NEW POSSIBILITIES OF AUTOMATION APPLICATIONS

PC CPU Module Partner Products

Q Series is able to mount a fully featured PC directly on the Q main base unit alongside the I/O and other CPU types.

Features

- Complete PC functionality in the space of three standard Q Series I/O modules
- Fully integrated into the Q Series system; the Q PC CPU is able to use all I/O, special function modules and networking options available with no special programming or hardware required
- Supplied driver software provides numerous program functions to allow third party program environments (such as Visual Basic ™ or Visual C++™) full access to all Q Series system components
- Q PC may be used standalone with no other processor types to offer a completely PC based control system where required
- May be combined with sequence, motion and process CPUs where required
- Industrially hardened design offers the same durability as the rest of the Q Series hardware components
- Comprehensive port selection allows multiple connection options to most third party devices (serial, parallel, USB, PCMCIA, Ethernet, monitor, keyboard, mouse, IDE, etc.)
- Fanless construction avoids maintenance issues
- Options for Microsoft Windows 2000, NT and NT Embedded
- Options for rotating media or solid state silicon disks

Type		PPC-CPU686 (MS) -128
MPU		Mobile Celeron Processor _LP 400MHz
Memory		128MB
Video memory		2MB
IF	USB	2 channels (1 channel as extra connector)
	Serial	2 channels (D-SUB 9P) (1 channel as extra connector)
	Parallel	1 channel (extra connector)
	PS2 mouse/keyboard	Mini DIN 6P can be used simultaneously by conversion cable.
	LAN	100BASE-TX/10BASE-T
	Display	Analog RGB H-Dsub 15P
	FDD	26P half connector (for connection of Contec make FDD)
	PC card	PCMCIA, CardBus Type Ⅰ, Ⅱ x 2 or Type Ⅲ x 1
Silicon disk module		Separate module (PCC-SDD (MS)-32/64/128/192/320/500/1000) 1 slot occupied
Hard disk module		Separate module (PPC-HDD (MS) -5) 5GB 1 slot occupied
OS		Windows® NT4.0, Windows® 2000, Windows® NT4.0 Embedded

GP-IB Module Partner Products

The GP-IB module is mounted on the Q series PLC base to communicate with measuring devices through GP-IB line.

Features

1. The text length that can be communicated at one time for send and receive combined is as large as 63422 bytes.
2. This module has a master/slave function.
   When the master function is selected, the module operates as a system controller and can send address, universal and other commands. When the slave function is selected, the module communicates data under the command of the system controller.

Type	EQGPIB
Number of connectable units	Max. 15 units (including this module)
Connection cable length	Between module and device, between devices: Within 2m (Within a total of 20m in a single system)
Max. text length	63422 bytes for send and receive combined
Data transfer speed	Transfer speed of the slowest device among the connected devices
Access from program	Intelligent function module direct device (or FROM / TO instruction) and I/O instruction
Number of occupied	I/O points 16 points per slot

PLC peripheral devices Partner Products

EHGP10
handy graphic programmer

- **Peripheral device designed for field:**
  The EHGP10 handy graphic programmer is a Peripheral device designed for field compatible with the MELSEC-QCPU as well as the QnA and A PLC CPUs. It also has high resistance to environment, and can be operated easily with the touch panel.
- **Programming unit:**
  The EPU01 programming unit is compatible with the MELSEC-QCPU as well as the QnA and A PLC CPUs, and can edit programs in the CPU, test devices, and monitor devices. (For the QCPU, this programming unit is usable with the high-performance model only.)

Factory Automation Goods Partner Products

The Q series has a wide variation of useful goods to further expand PLC applications.

●Product list

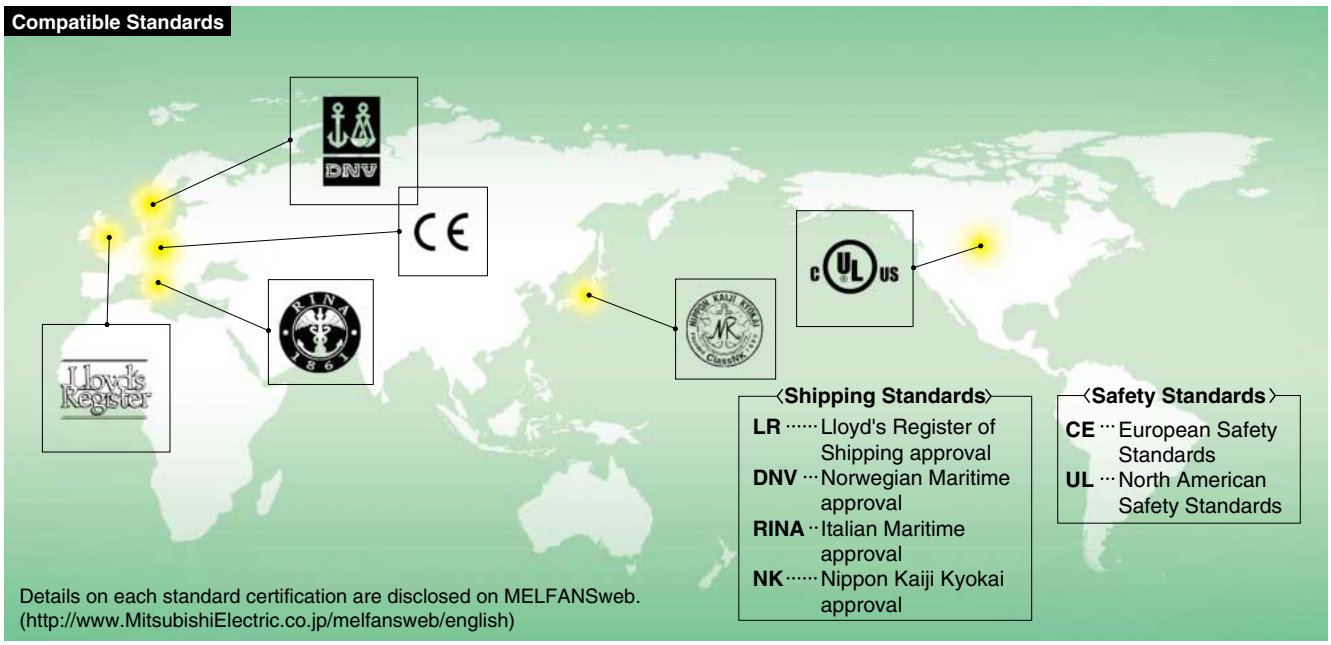
Class	Product	Type	Outline
CPU module-compatible communication module, intelligent module compatible	Connection cable	FA-CBLQC***R2	RS-232C cable for connection of personal computer and CPU (Mini-DIN 6P male)-(D-Sub 9P female) (3, 5, 15m)
		FA-CBL30USB	USB cable for connection of personal computer and CPU (3m)
		FA-CBL25P6P***	RS-232 cable for connection of personal computer, display or like and CPU (Mini-DIN 6P male)-(D-Sub 25P male) (3, 5, 14m)
		FA-CBL9S9P***	RS-232 cable for connection of personal computer and intelligent module (D-Sub 9P male)-(D-Sub 9P female) (3, 5, 15m)
	Optical converter	FA-OPT232**	Optical converter for connection of RS-232 device
	Conversion cable	FA-CBL25S***	Conversion cable for connection of optical converter (0.2m)
	Conversion adaptor	FA-A25S***	Conversion adaptor for connection of optical converter
	Fiber-optic cable	FA-FB****M*	Fiber-optic cable for connection of optical converter (within enclosure, indoors, portable, outdoors)
DC: Input, output module (connector type) compatible	Screwless terminal block conversion module	FA-TE(W)32XY	32-point screwless terminal block module for DC
	Quick connector type distributed module	FA-CB**XY*	Quick connector type 8- or 16-point distributed module for DC
	Connector/terminal block conversion module	FA-TB**XY*	Terminal block type 8- or 16-point distributed module or 32-point terminal block module for DC
	Connection cable	FA-CBL***FMV	Cable for connection of input or output module and quick connector type distributed module or connector/terminal block conversion module
		FA- (F) CBL***MMH	Cable for connection of quick connector type distributed modules or terminal block type distributed modules
AC/DC: Input, output module (terminal block type) compatible	PLC/terminal block conversion module	FA-TB161AC**	Terminal block conversion module for AC/DC, 16 points/common, 1- or 2-wire type
	Connection cable	FA-CBL**TD	Cable for connection of input or output module and PLC/terminal block conversion module
DC: Output module (connector type) compatible	Interface terminal unit	FA-TH16Y*****	Relay, triac or transistor output terminal unit (16 points)
	Connection cable	FA-CBL***FM2V	Cable for connection of interface terminal unit, 40 cores
		FA-CBL***MMH20	Cable for connection of interface terminal unit, 20 cores
Positioning module compatible	Connection cable	FA-CBLQ75*****	Cable for connection of positioning module and servo amplifier (for QD75)
		FA-CBLQ70***	Cable for connection of positioning module and servo amplifier (for QD70)
Thermocouple input module compatible	Converter module	FA-TB20TD	Terminal block module for Q64TD Connection cable
	Connection cable	FA-CBLQ64TD**	Cable for connection of Q64TD terminal block module
Temperature control module	Converter module	FA-TB20TC	Terminal block module for Q64TCTT (BW)
	Connection cable	FA-CBLQ64TC**	Cable for connection of Q64TCTT (BW) terminal block module

Global technology and reliability

Complying with international quality assurance standards.

All of Mitsubishi Electric's FA component products have acquired the international quality assurance “ISO9001” and environment management system standard “ISO14001” certification. Mitsubishi's products also comply with various safety standards, including UL Standards, and shipping standards.

Compatible Standards



〈Shipping Standards〉

- **LR** ····· Lloyd's Register of Shipping approval
- **DNV** ··· Norwegian Maritime approval
- **RINA** ·· Italian Maritime approval
- **NK** ····· Nippon Kaiji Kyokai approval

〈Safety Standards〉

- **CE** ··· European Safety Standards
- **UL** ··· North American Safety Standards

Details on each standard certification are disclosed on MELFANSweb.
(http://www.MitsubishiElectric.co.jp/melfansweb/english)

Global FA Center

“Mitsubishi FA Centers” are located throughout North America, Europe and Asia to develop products complying with international standards and to provide attentive services.

◎NORTH AMERICAN FA CENTER

MITSUBISHI ELECTRIC AUTOMATION, INC.
500 Corporate Woods Parkway Vernon Hills, IL 60061 U.S.A
Tel: 1-847-478-2469 Fax: 1-847-478-2396
The target area: North America, Mexico

◎EUROPEAN FA CENTER

MITSUBISHI ELECTRIC EUROPE B.V.GERMANBRANCH
(Industrial Automation Division) Gothaer Strasse 8 D-40880 Ratingen, Germany
Tel: 49-2102-486-2630 Fax: 49-2102-486-7170
The target area: Europe

◎UK FA CENTER

MITSUBISHI ELECTRIC EUROPE B.V. UK BRANCH
(Customer Technical Center) Travellers Lane, Hatfield, Herts., AL10 8XB, UK
Tel: 44-1707-278843 Fax: 44-1707-278992
The target area: UK, Ireland

◎KOREAN FA CENTER

HAN NEUNG ELECTRIC CO., LTD.
2F, Dong Seo Game Channel Bldg., 660-11, Deungchon-dong, Kangseo-Ku, Seoul 157-030, Korea
Tel: 82-2-3660-9607 Fax: 82-2-3663-0475
The target area: Korea

◎HONG KONG FA CENTER

RYODEN AUTOMATION LTD. (FA DIVISION)
10/F., Manulife Tower, 169 Electric Road, North Point, Hong Kong
Tel: 852-2887-8870 Fax: 852-2887-7984
The target area: China

◎TIANJIN FA CENTER

RYODEN AUTOMATION (SHANGHAI) LTD.,TIANJIN OFFICE
Room No. 909, Great Ocean Building, No. 200 Shi Zi Lin Avenue, He Bei District, Tianjin China
Tel: 86-22-26359090 Fax: 86-22-26359050
The target area: China

◎SHANGHAI FA CENTER

RYODEN AUTOMATION (SHANGHAI) LTD.
2F Block5 Building Automation Instrumentation Plaza 103 Cao Bao Rd. Shanghai 200233, China
Tel: 86-21-6484-9360 Fax: 86-21-6484-9361
The target area: China

◎BEIJING FA CENTER

RYODEN AUTOMATION (SHANGHAI) LTD.,BEIJING OFFICE
Unit 917-918, 9/F Office Tower 1, Henduson Center, 18 Jianquomennei Dajie, Dongcheng District, Beijing 100005 China
Tel: 86-10-6518-8830 Fax: 86-10-6518-8030
The target area: China

◎TAIPEI FA CENTER

MITSUBISHI ELECTRIC TAIWAN CO., LTD.
3F., No. 122 Wu Kung 2nd RD, Wu-Ku Hsiang, Taipei Hsien, Taiwan
Tel: 886-2-2299-3060 Fax: 886-2-2298-1909
The target area: Taiwan

SETSUYO ENTERPRISE CO., LTD.
6F NO.105 Wu-Kung 3rd. RD, Wu-Ku Hsiang Taipei Hsiene, Taiwan
Tel: 886-2-2299-2499 Fax: 886-2-2299-2509
The target area: Taiwan

◎TAICHUNG FA CENTER

MITSUBISHI ELECTRIC TAIWAN CO., LTD.
No. 8-1 gong Yeh 16th RD, Taichung Industrial Park, Taichung City, Taiwan
Tel: 886-4-2359-0688 Fax: 886-4-2359-0689
The target area: Taiwan

SETSUYO ENTERPRISE CO., LTD.
7F-7, No. 77, Zheng Bei 1st RD, Taichung City, Taiwan
Tel: 886-4-2258-1027 Fax: 886-4-2252-0967
The target area: Taiwan

◎ASEAN FA CENTER

MITSUBISHI ELECTRIC ASIA PTE, LTD.
307 Alexandra Road #05-01/02 Mitsubishi Electric Building Singapore, 159943
Tel: 65-6473-2480 Fax: 65-6476-7439
The target area: Southeast Asia, India

MELFANSweb - your source for FA information

"MELFANSweb" covers various information related Mitsubishi FA devices. This site is well supported by users with more than 100,000 hits a day. Information on products, FA terminology and seminar information, etc., are listed on this site to powerfully support all Q series users.

■ Real-time search of information on internet

"MELFANSweb" can be accessed from a personal computer using the internet. The latest information is always only a click away.

MELFANSweb web site URL:

http://www.MitsubishiElectric.co.jp/melfansweb/english

List of Related Catalogs

01. MELSEC Q Series Data Book L (NA) 08029E

02. MELSEC Process Control Catalog L (NA) 08030E

03. Motion Controller Catalog L (NA) 03014

04. CC-Link Compatible Product Catalog L (NA) 08018E

05. CC-Link/LT Compatible Product Catalog L (NA) 08026E

06. MELSOFT Catalog L (NA) 08008

07. GOT-A900series Catalog L (NA) 08013

08. MELSERVO-J2-Super Catalog L (NA) 03007

09. Inverter Family Catalog L (NA) 06036

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WARRANTY

Please confirm the following product warranty details before starting use.

Gratis Warranty Term and Gratis Warranty Range

If any faults or defects (hereinafter "Failure") found to be the responsibility of Mitsubishi occurs during use of the product within the gratis warranty term, the product shall be repaired at no cost via the dealer or Mitsubishi Service Company.
Note that if repairs are required at a site overseas, on a detached island or remote place, expenses to dispatch an engineer shall be charged for.

Gratis Warranty Term

The gratis warranty term of the product shall be for one year after the date of purchase or delivery to a designated place.
Note that after manufacture and shipment from Mitsubishi, the maximum distribution period shall be six (6) months, and the longest gratis warranty term after manufacturing shall be eighteen (18) months. The gratis warranty term of repair parts shall not exceed the gratis warranty term before repairs.

Gratis Warranty Range

(1) The range shall be limited to normal use within the usage state, usage methods and usage environment, etc., which follow the conditions and precautions, etc., given in the instruction manual, user's manual and caution labels on the product.
(2) Even within the gratis warranty term, repairs shall be charged for in the following cases.
1. Failure occurring from inappropriate storage or handling, carelessness or negligence by the user. Failure caused by the user's hardware or software design.
2. Failure caused by unapproved modifications, etc., to the product by the user.
3. When the Mitsubishi product is assembled into a user's device, Failure that could have been avoided if functions or structures, judged as necessary in the legal safety measures the user's device is subject to or as necessary by industry standards, had been provided.
4. Failure that could have been avoided if consumable parts (battery, backlight, fuse, etc.) designated in the instruction manual had been correctly serviced or replaced.
5. Failure caused by external irresistible forces such as fires or abnormal voltages, and Failure caused by force majeure such as earthquakes, lightning, wind and water damage.
6. Failure caused by reasons unpredictable by scientific technology standards at time of shipment from Mitsubishi.
7. Any other failure found not to be the responsibility of Mitsubishi or the user.

Onerous repair term after discontinuation of production

(1) Mitsubishi shall accept onerous product repairs for seven (7) years after production of the product is discontinued. Discontinuation of production shall be notified with Mitsubishi Technical Bulletins, etc.
(2) Product supply (including repair parts) is not possible after production is discontinued.

Overseas service

Overseas, repairs shall be accepted by Mitsubishi's local overseas FA Center. Note that the repair conditions at each FA Center may differ.

Exclusion of chance loss and secondary loss from warranty liability

Regardless of the gratis warranty term, Mitsubishi shall not be liable for compensation to damages caused by any cause found not to be the responsibility of Mitsubishi, chance losses, lost profits incurred to the user by Failures of Mitsubishi products, damages and secondary damages caused from special reasons regardless of Mitsubishi's expectations, compensation for accidents, and compensation for damages to products other than Mitsubishi products and other duties.

Changes in product specifications

The specifications given in the catalogs, manuals or technical documents are subject to change without prior notice.

Product application

(1) In using the Mitsubishi MELSEC programmable logic controller, the usage conditions shall be that the application will not lead to a major accident even if any problem or fault should occur in the programmable logic controller device, and that backup and fail-safe functions are systematically provided outside of the device for any problem or fault.
(2) The Mitsubishi general-purpose programmable logic controller has been designed and manufactured for applications in general industries, etc. Thus, applications in which the public could be affected such as in nuclear power plants and other power plants operated by respective power companies, and applications in which a special quality assurance system is required, such as for Railway companies or National Defense purposes shall be excluded from the programmable logic controller applications.
Note that even with these applications, if the user approves that the application is to be limited and a special quality is not required, application shall be possible.
When considering use in aircraft, medical applications, railways, incineration and fuel devices, manned transport devices, equipment for recreation and amusement, and safety devices, in which human life or assets could be greatly affected and for which a particularly high reliability is required in terms of safety and control system, please consult with Mitsubishi and discuss the required specifications.

CPU, base, power supply

Product		Type	Outline
CPU	Basic Model	Q00JCPU	No. of input points: 256 points No. of input/output device points: 2048 points Program capacity: 8k steps Basic instruction processing speed (LD instruction): 0.20μs Program memory capacity: 58kbyte Standard ROM capacity: 58kbyte, 5 slots, 100 to 240VAC input/5VDC 3A output power supply
		Q00CPU	No. of input points: 1024 points No. of input/output device points: 2048 points Program capacity: 8k steps Basic instruction processing speed (LD instruction): 0.16μs Program memory capacity: 94kbyte Standard RAM capacity: 128kbyte, Standard ROM capacity: 94kbyte
		Q01CPU	No. of input points: 1024 points No. of input/output device points: 2048 points Program capacity: 14k steps Basic instruction processing speed (LD instruction): 0.10μs Program memory capacity: 94kbyte Standard RAM capacity: 128kbyte, Standard ROM capacity: 94kbyte
	High Performance Model	Q02CPU	No. of input points: 4096 points No. of input/output device points: 8192 points Program capacity: 28k steps Basic instruction processing speed (LD instruction): 0.079μs Program memory capacity: 112kbyte Standard RAM capacity: 64kbyte, Standard ROM capacity: 112kbyte
		Q02HCPU	No. of input points: 4096 points No. of input/output device points: 8192 points Program capacity: 28k steps Basic instruction processing speed (LD instruction): 0.034μs Program memory capacity: 112kbyte Standard RAM capacity: 128kbyte, Standard ROM capacity: 112kbyte
		Q06HCPU	No. of input points: 4096 points No. of input/output device points: 8192 points Program capacity: 60k steps Basic instruction processing speed (LD instruction): 0.034μs Program memory capacity: 240kbyte Standard RAM capacity: 128kbyte, Standard ROM capacity: 240kbyte
		Q12HCPU	No. of input points: 4096 points No. of input/output device points: 8192 points Program capacity: 124k steps Basic instruction processing speed (LD instruction): 0.034μs Program memory capacity: 496kbyte Standard RAM capacity: 256kbyte, Standard ROM capacity: 496kbyte
		Q25HCPU	No. of input points: 4096 points No. of input/output device points: 8192 points Program capacity: 252k steps Basic instruction processing speed (LD instruction): 0.034μs Program memory capacity: 1008kbyte Standard RAM capacity: 256kbyte, Standard ROM capacity: 1008kbyte
	Process CPU	Q12PHCPU	No. of input points: 4096 points No. of input/output device points: 8192 points Program capacity: 124k steps Basic instruction processing speed (LD instruction): 0.034μs Program memory capacity: 496kbyte Standard RAM capacity: 256kbyte, Standard ROM capacity: 496kbyte
		Q25PHCPU	No. of input points: 4096 points No. of input/output device points: 8192 points Program capacity: 252k steps Basic instruction processing speed (LD instruction): 0.034μs Program memory capacity: 1008kbyte Standard RAM capacity: 256kbyte, Standard ROM capacity: 1008kbyte
	Motion CPU	Q172CPUN	For 8-axis control
		Q173CPUN	For 32-axis control
	Battery	Q6BAT	Replacement battery
		Q7BAT	Large capacity battery
		Q7BAT-SET	Large capacity battery with holder
	Memory card	Q2MEM-1MBS	SRAM memory card Capacity: 1Mbyte
		Q2MEM-2MBS	SRAM memory card Capacity: 2Mbyte
		Q2MEM-2MBF	Linear Flash memory card Capacity: 2Mbyte
		Q2MEM-4MBF	Linear Flash memory card Capacity: 4Mbyte
		Q2MEM-8MBA	ATA card Capacity: 8Mbyte
		Q2MEM-16MBA	ATA card Capacity: 16Mbyte
		Q2MEM-32MBA	ATA card Capacity: 32Mbyte
	Memory card adaptor	Q2MEM-ADP	Adaptor for Q2MEM memory card's standard PCMCIA slot
	SRAM card battery	Q2MEM-BAT	Replacement battery for Q2MEM-1MBS/ Q2MEM-2MBS
	Connection cable	QC30R2	RS-232 cable for connection of personal computer and CPU, 3m (mini-DIN 6P)-(Dsub 9P)
	Cable disconnection prevention holder	Q6HLD-R2	Holder for prevention of RS-232 cable disconnection
Base	Main base	Q33B	3 slots power supply module, mountable for Q series modules
		Q35B	5 slots power supply module, mountable for Q series modules
		Q38B	8 slots power supply module, mountable for Q series modules
		Q312B	12 slots power supply module, mountable for Q series modules
	Slim type main base	Q32SB	2 slots slime type power supply module, mountable for Q series modules
		Q33SB	3 slots slime type power supply module, mountable for Q series modules
		Q35SB	5 slots slime type power supply module, mountable for Q series modules
	Extension base	Q63B	3 slots power supply module, mountable for Q series modules
		Q65B	5 slots power supply module, mountable for Q series modules
		Q68B	8 slots power supply module, mountable for Q series modules
		Q612B	12 slots power supply module, mountable for Q series modules
		Q52B	2 slots power supply module, mountable for Q series modules
		Q55B	5 slots power supply module, mountable for Q series modules
		QA1S65B (Note 1)	5 slots power supply module, mountable for AnS series modules
		QA1S68B (Note 1)	8 slots power supply module, mountable for AnS series modules
		QA65B (Note 1)	5 slots power supply module, mountable for A series modules
	Extension cable	QC05B	0.45m cable for Q52B, Q55B, Q63B, Q65B, Q68B, Q612B connection
		QC06B	0.6m cable for Q52B, Q55B, Q63B, Q65B, Q68B, Q612B connection
		QC12B	1.2m cable for Q52B, Q55B, Q63B, Q65B, Q68B, Q612B connection
		QC30B	3m cable for Q52B, Q55B, Q63B, Q65B, Q68B, Q612B connection
		QC50B	5m cable for Q52B, Q55B, Q63B, Q65B, Q68B, Q612B connection
		QC100B	10m cable for Q52B, Q55B, Q63B, Q65B, Q68B, Q612B connection
	Adaptor	Q6DIN1	DIN rail mounting adaptor for Q38B, Q312B, Q68B, Q612B
		Q6DIN2	DIN rail mounting adaptor for Q35B, Q65B, Q00JCPU
		Q6DIN3	DIN rail mounting adaptor for Q32SB, Q33SB, Q35SB, Q33B, Q52B, Q55B, Q63B
	Blank cover	QG60	Blank cover for I/O slot
Power supply		Q61P-A1	Input voltage range: 100-120VAC Output voltage: 5VDC Output current: 6A
		Q61P-A2	Input voltage range: 200-240VAC Output voltage: 5VDC Output current: 6A
		Q62P	Input voltage range: 100 to 240VAC Output voltage: 5/24VDC Output current: 3/0.6A
		Q63P	Input voltage range: 24VDC Output voltage: 5VDC Output current: 6A
		Q64P	Input voltage range: 100 to 120VAC/200 to 240VAC Output voltage: 5VDC Output current: 8.5A
Slim type power supply		Q61SP	Input voltage range: 100 to 240VAC Output voltage: 5VDC Output current: 2A Slim type power supply

Input/output module

Product		Type	Outline
Input	AC	QX10	16 points 100 to 120VAC 8mA (100VAC, 60Hz)/7mA (100VAC, 50Hz) response time: 20ms 16 points/common 18-point terminal block
		QX28	8 points 100 to 240VAC 17mA (200VAC, 60Hz)/14mA (200VAC, 50Hz)/8mA (100VAC, 60Hz) / 7mA (100VAC, 50Hz) response time: 20ms 8 points/common 18-point terminal block
	DC (Positive common) (Note 2)	QX40	16 points 24VDC 4mA response time: 1/5/10/20/70ms 16 points/common Positive common 18-point terminal block
		QX40-S1	16 points 24VDC 6mA response time: 0.1/0.2/0.4/0.6/1ms 16 points/common Positive common 18-point terminal block
		QX41 (Note 3)	32 points 24VDC 4mA response time: 1/5/10/20/70ms 32 points/common Positive common 40-pin connector
		QX41-S1 (Note 3)	32 points 24VDC 4mA response time: 0.1/0.2/0.4/0.6/1ms 32 points/common Positive common 40-pin connector
		QX42 (Note 3)	64 points 24VDC 4mA response time: 1/5/10/20/70ms 32 points/common Positive common 40-pin connector
		QX42-S1 (Note 3)	64 points 24VDC 4mA response time: 0.1/0.2/0.4/0.6/1ms 32 points/common Positive common 40-pin connector
	DC sensor (Note 2)	QX70	16 points 5/12VDC 1.2mA (5VDC)/3.3mA (12VDC) response time: 1/5/10/20/70ms 16 points/common positive common/negative common combination use 18-point terminal block
		QX71 (Note 3)	32 points 5/12VDC 1.2mA (5VDC)/3.3mA (12VDC) response time: 1/5/10/20/70ms 32 points/common positive common/negative common combination use 40-pin connector
		QX72 (Note 3)	64 points 5/12VDC 1.2mA (5VDC)/3.3mA (12VDC) response time: 1/5/10/20/70ms 32 points/common positive common/negative common combination use 40-pin connector
	DC (Negative common) (Note 2)	QX80	16 points 24VDC 4mA response time: 1/5/10/20/70ms 16 points/common negative common 18-point terminal block
		QX81 (Note 4)	32 points 24VDC 4mA response time: 1/5/10/20/70ms 32 points/common negative common 37-pin D-sub connector
		QX82 (Note 3)	64 points 24VDC 4mA response time: 1/5/10/20/70ms 32 points/common negative common 40-pin connector
		QX82-S1 (Note 3)	64 points 24VDC 4mA response time: 0.1/0.2/0.4/0.6/1ms 32 points/common negative common 40-pin connector
Output	Relay	QY10	16 points 24VDC/240VAC 2A/point 8A/common response time: 12ms 16 points/common 18-point terminal block
		QY18A	8 points 24VDC/240VAC 2A/point response time: 12ms 18-point terminal block all points independent Relay
	Triac	QY22	16 points 100 to 240VAC 0.6A/points 4.8A/common Minimum load voltage Current: 24VAC 100mA/100/240VAC 25mA Leakage at OFF: 1.5mA (120VAC) / 3mA (240VAC) response time: 1ms + 0.5Hz 16 points/common 18-point terminal block with surge suppressor
	Transistor (Sink)	QY40P	16 points 12 to 24VDC 0.1A/points 1.6A/common Leakage at OFF: 0.1mA response time: 1ms 16 points/common sink type 18-point terminal block with thermal protection, short-circuit protection and surge suppressor
		QY41P (Note 3)	32 points 12 to 24VDC 0.1A/points 2A/common Leakage at OFF: 0.1mA response time: 1ms 32 points/common sink type 40-pin connector with thermal protection, short-circuit protection and surge suppressor
		QY42P (Note 3)	64 points 12 to 24VDC 0.1A/points 2A/common Leakage at OFF: 0.1mA response time: 1ms 32 points/common sink type 40-pin connector with thermal protection, short-circuit protection and surge suppressor
		QY50	16 points 12 to 24VDC 0.5A/points 4A/common Leakage at OFF: 0.1mA response time: 1ms 16 points/common sink type 18-point terminal block with thermal protection, surge suppressor and fuse
	Transistor (Independent)	QY68A	8 points 5 to 24VDC 2A/points 8A/module Leakage at OFF: 0.1mA response time: 10ms sink/source combination type 18-point terminal block with surge suppressor all points independent
	TTL CMOS	QY70	16 points 5 to 12VDC 10mA/points 256mA/common response time: 0.5ms 16 points/common sink type 18-point terminal block with fuse
		QY71 (Note 3)	32 points 5 to 12VDC 16mA/points 512mA/common response time: 0.5ms 32 points/common sink type 40-pin connector with fuse
	Transistor (Source)	QY80	16 points 12 to 24VDC 0.5A/points 4A/common Leakage at OFF: 0.1mA response time: 1ms 16 points/common source type 18-point terminal block with surge suppressor and fuse
		QY81P (Note 4)	32 points 12 to 24VDC 0.1A/points 2A/common Leakage at OFF: 0.1mA response time: 1ms 32 points/common source type 37-pin D-sub connector with thermal protection, short-circuit protection and surge suppressor
Input/ output	DC input/ transistor output	QH42P (Note 3)	Input 32 points 24VDC 4mA response time: 1/5/10/20/70ms Positive common output 32 points 12 to 24VDC 0.1A/points 2A/common Leakage at OFF: 0.1mA response time: 1ms sink type 40-pin connector with thermal protection, short-circuit protection and surge suppressor
		QX48Y57	Input 8 points 24VDC 4mA response time: 1/5/10/20/70ms Positive common output 7 points 12 to 24VDC 0.5A/points 2A/common Leakage at OFF: 0.1mA response time: 1ms 7 points/common sink type 18-point terminal block with surge suppressor and fuse
Interrupt module	DC (Positive common)	QI60	16 points 24VDC 4mA response time: 0.1/0.2/0.4/0.6/1ms 16 points/common 18-point terminal block
Connector		A6CON1	Soldering 32-point connector (40-pin connector)
		A6CON2	Solderless terminal connection 32-point connector (40-pin connector)
		A6CON3	Flat cable pressure-displacement 32-point connector (40-pin connector)
		A6CON4	Soldering 32-point connector (40-pin connector)
		A6CON1E	Soldering 32-point connector (37-pin D-sub connector)
		A6CON2E	Solderless terminal connection 32-point connector (37-pin D-sub connector)
		A6CON3E	Flat cable pressure-displacement 32-point connector (37-pin D-sub connector)
Spring clamp terminal block		Q6TE-18S	For 16-point I/O, 0.3 to 1.5mm^2 (AWG22 to 16)
Terminal block adaptor		Q6TA32	For 32-point I/O, 0.5mm^2 (AWG20)
		Q6TA32-TOL	Tool exclusively used for Q6TA32

Analog input/output module

Product		Type	Outline
Analog input	Voltage input	Q68ADV	8 channels Input: -10 to 10VDC Output (resolution): 0 to 4000, -4000 to 4000, 0 to 12000, -12000 to 12000, 0 to 16000, -16000 to 16000 Conversion speed: 80μs/channel 18-point terminal block
	Current input	Q62AD-DGH	2 channels Input: 4 to 20mADC Output (resolution): 0 to 3200, 0 to 6400 Conversion speed: 10ms/2channel 18-point terminal block channel isolated, power supply to 2-wire transmitter
		Q68ADI	8 channels Input: 0 to 20mADC Output (resolution): 0 to 4000, -4000 to 4000, 0 to 12000, -12000 to 12000, 0 to 16000, -16000 to 16000 Conversion speed: 80μs/channel 18-point terminal block
	Voltage/ current input	Q64AD	4 channels Input: -10 to 10VDC, 0 to 20mADC Output (resolution): 0 to 4000, -4000 to 4000, 0 to 12000, -12000 to 12000, 0 to 16000, -16000 to 16000 Conversion speed: 80ms/channel 18-point terminal block
		Q64AD-GH	4 channels Input: -10 to 10VDC, 0 to 20mADC Output (resolution): 0 to 32000, -32000 to 32000, 0 to 64000, -64000 to 64000 Conversion speed: 10ms/4channel 18-point terminal block channel isolated
Analog output	Voltage output	Q68DAV	8 channels Input (resolution): 0 to 4000, -4000 to 4000, 0 to 12000, -12000 to 12000, -16000 to 16000 Output: -10 to 10VDC Conversion speed: 80μs/channel 18-point terminal block
	Current output	Q68DAI	8 channels Input (resolution): 0 to 4000, -4000 to 4000, 0 to 12000, -12000 to 12000 Output: 0 to 20mADC Conversion speed: 80μs/channel 18-point terminal block
	Voltage/ current output	Q62DA	2 channels Input (resolution): 0 to 4000, -4000 to 4000, 0 to 12000, -12000 to 12000, -16000 to 16000 Output: -10 to 10VDC, 0 to 20mADC Conversion speed: 80μs/channel 18-point terminal block
		Q62DA-FG	2 channels Input (resolution): 0 to 12000, -12000 to 12000, -16000 to 16000 Output: -12 to 12VDC, 0 to 22mADC Conversion speed: 10ms/2channel 18-point terminal block channel isolated
		Q64DA	4 channels Input (resolution): 0 to 4000, -4000 to 4000, 0 to 12000, -12000 to 12000, -16000 to 16000 Output: -10 to 10VDC, 0 to 20mADC Conversion speed: 80μs/channel 18-point terminal block
Temperature input	Platinum temperature-measuring resistor	Q64RD	4 channels Platinum temperature-measuring resistor (Pt100 (JIS C 1604-1997, IEC 751 1983), JPt100 (JIS C1604-1981)) conversion speed: 40ms/channel 18-point terminal block
		Q64RD-G	4 channels Platinum temperature-measuring resistor (Pt100 (JIS C1604-1997, IEC 751 1983), JPt100 (JIS C1604-1981), Ni100W (DIN43760 1987)) Conversion speed: 40ms/channel 18-point terminal block channel isolated
	Thermocouple	Q64TD	4 channels thermocouple (JIS C1602-1995) conversion speed: 40ms/channel 18-point terminal block
		Q64TDV-GH	4 channels thermocouple (JIS C1602-1995) micro voltage (-100mV to 100mV) conversion speed: (sampling cycle x 3)/channel 18-point terminal block
Temperature control	Platinum temperature-measuring resistor	Q64TCRT	4 channels Platinum temperature-measuring resistor (Pt100, JPt100) No heater wire break detection sampling cycle: 0.5s/4channels 18-point terminal block
		Q64TCRTBW	4 channels Platinum temperature-measuring resistor (Pt100, JPt100) heater wire break detection sampling cycle: 0.5s/4channel 18-point terminal block x 2
	Thermocouple	Q64TCTT	4 channels thermocouple (K, J, T, B, S, E, R, N, U, L, PLII, W5Re/W26Re) No heater wire break detection sampling cycle: 0.5s/4channel 18-point terminal block
		Q64TCTTBW	4 channels thermocouple (K, J, T, B, S, E, R, N, U, L, PLII, W5Re/W26Re) Heater wire break detection Sampling cycle: 0.5s/4channel 18-point terminal block x 2

Pulse input/output and positioning module

Channel-isolated pulse input		QD60P8-G	8 channels 30kpps/10kpps/1kpps/100pps/50pps/10pps/1pps/0.1pps count input signal: 5/12 to 24VDC
High-speed counter (Note 3)		QD62	2 channels 200/100/10kpps count input signal: 5/12/24VDC external input: 5/12/24VDC match output: transistor (sink) 12/24VDC, 0.5A/point, 2A/1common 40-pin connector
		QD62D	2 channels 500/200/100/10kpps count input signal: EIA Standards RS-422A (Differential line driver) external input: 5/12/24VDC match output: transistor (sink) 12/24VDC, 0.5A/point, 2A/1common 40-pin connector
		QD62E	2 channels 200/100/10kpps count input signal: 5/12/24VDC external input: 5/12/24VDC match output: transistor (source) 12/24VDC, 0.1A/point, 0.4A/common 40-pin connector
Positioning	Open collector output (Note 5)	QD75P1	1-axis control unit: mm, inch, degree, pulse No. of positioning data items: 600 data items/axis max. output pulse: 200kpps 40-pin connector
		QD75P2	2-axis 2-axis linear interpolation, 2-axis circular interpolation control unit: mm, inch, degree, pulse No. of positioning data items: 600 data items/axis max. output pulse: 200kpps 40-pin connector
		QD75P4	4-axis 2-axis, 3-axis, 4-axis linear interpolation 2-axis circular interpolation control unit: mm, inch, degree, pulse No. of positioning data items: 600 data items/axis max. output pulse: 200kpps 40-pin connector
	Differential output (Note 5)	QD75D1	1-axis control unit: mm, inch, degree, pulse No. of positioning data items: 600 data items/axis max. output pulse: 1Mpps 40-pin connector
		QD75D2	2-axis 2-axis linear interpolation, 2-axis circular interpolation control unit: mm, inch, degree, pulse No. of positioning data items: 600 data items/axis max. output pulse: 1Mpps 40-pin connector
		QD75D4	4-axis 2-axis, 3-axis, 4-axis linear interpolation 2-axis circular interpolation control unit: mm, inch, degree, pulse No. of positioning data items: 600 data items/axis max. output pulse: 1Mpps 40-pin connector
	SSCNET connection (Note 3)	QD75M1	1-axis control unit: mm, inch, degree, pulse No. of positioning data items: 600 data items/axis 40-pin connector
		QD75M2	2-axis 2-axis linear interpolation, 2-axis circular interpolation control unit: mm, inch, degree, pulse No. of positioning data items: 600 data items/axis 40-pin connector
		QD75M4	4-axis 2-axis, 3-axis, 4-axis linear interpolation 2-axis circular interpolation control unit: mm, inch, degree, pulse No. of positioning data items: 600 data items/axis 40-pin connector
	Open collector output (Note 5)	QD70P4	4-axis control unit: pulse No. of positioning data items: 10 data items/axis max. output pulse: 200kpps 40-pin connector
		QD70P8	8-axis control unit: pulse No. of positioning data items: 10 data items/axis max. output pulse: 200kpps 40-pin connector

Information module

Product		Type	Outline
Ethernet		QJ71E71-100	10BASE-T/100BASE-TX
		QJ71E71-B2	10BASE2
		QJ71E71-B5	10BASE5
Serial communication		QJ71C24N	RS-232 1 channel RS-422/485 1 channel Transmission speed: 230.4kbps total for two channels GX Configurator-SC Version 2 compatible
		QJ71C24N-R2	RS-232 2 channel Transmission speed: 230.4kbps total for two channels GX Configurator-SC Version 2 compatible
		QJ71C24N-R4	RS-422/485 2 channels Transmission speed: 230.4kbps total for two channels GX Configurator-SC Version 2 compatible
Intelligent communication		QD51	Basic program execution module RS-232 2 channels
		QD51-R24	Basic program execution module RS-232 1 channel RS-422/485 1 channel
		SW□IVD-AD51HP (Note 6)	QD51H software package (shared between AD51H-S3/A1SD51HS)

Control network module

MELSECNET/H	SI/QSI optical cable	QJ71LP21-25	SI, QSI, H-PCF, broadband H-PCF optical cable duplex loop PLC-to-PLC network (control station/normal station)/ remote I/O network (remote master station)
		QJ71LP21S-25	SI, QSI, H-PCF, broadband H-PCF optical cable duplex loop PLC-to-PLC network (control station/normal station)/ remote I/O network (remote master station) external supply power function
		QJ72LP25-25	SI, QSI, H-PCF, broadband H-PCF optical cable duplex loop Remote I/O network (remote I/O station)
	GI-50/125 optical cable	QJ71LP21G	GI-50/125 optical cable duplex loop PLC-to-PLC network (control station/normal station)/ remote I/O network (remote master station)
		QJ72LP25G	GI-50/125 optical cable duplex loop Remote I/O network (remote I/O station)
	GI-62.5/125 optical cable	QJ71LP21GE	GI-62.5/125 optical cable duplex loop PLC-to-PLC network (control station/normal station)/ remote I/O network (remote master station)
		QJ72LP25GE	GI-62.5/125 optical cable duplex loop Remote I/O network (remote I/O station)
	Coaxial cable	QJ71BR11	3C-2V/5C-2V coaxial cable simplex bus PLC-to-PLC network (control station/normal station)/ remote I/O network (remote master station)
		QJ72BR15	3C-2V/5C-2V coaxial cable simplex bus Remote I/O network (remote I/O station)
CC-Link		QJ61BT11N	Master station/local station combined use, CC-Link Ver. 2 compatible
CC-Link/LT		QJ61CL12	Master station
FL-net (OPCN-2)	Ver. 2.00 specifications	QJ71FL71-T-F01	10BASE-T
		QJ71FL71-B2-F01	10BASE2
		QJ71FL71-B5-F01	10BASE5
AS-i		QJ71AS92	Master station, AS-i standard version 2.11 compatible

A mode CPU, base

CPU		Q02CPU-A	For A mode No. of input points: 4096 points No. of input/output device points: 8192 points Program capacity: 28k steps Basic instruction processing speed (LD instruction): 0.079μs Program memory capacity: 144kbyte, Standard ROM capacity: 144kbyte
		Q02HCPU-A	For A mode No. of input points: 4096 points No. of input/output device points: 8192 points Program capacity: 28k steps Basic instruction processing speed (LD instruction): 0.034μs Program memory capacity: 144kbyte, Standard ROM capacity: 144kbyte
		Q06HCPU-A	For A mode No. of input points: 4096 points No. of input/output device points: 8192 points Program capacity: 30k steps (main) 30k steps (sub) Basic instruction processing speed (LD instruction): 0.034μs Program memory capacity: 144kbyte, Standard ROM capacity: 144kbyte
Base	Main base	QA1S33B	3 slots, power supply module mountable, for AnS series modules
		QA1S35B	5 slots, power supply module mountable, for AnS series modules
		QA1S38B	8 slots, power supply module mountable, for AnS series modules
	Extension base	QA1S65B	5 slots, power supply module mountable, for AnS series modules
		QA1S68B	8 slots, power supply module mountable, for AnS series modules

MELSOFT GX Series

Product	Type	Outline
GX Developer	SW□D5C-GPPW-E	MELSEC PLC programming software
	SW□D5C-GPPW-EV	MELSEC PLC programming software (Upgrade)
GX Simulator	SW□D5C-LLT-E	MELSEC PLC simulation software
	SW□D5C-LLT-EV	MELSEC PLC simulation software (Upgrade)
GX Explorer	SW□D5C-EXP-E	Maintenance tool
	SW□D5C-EXP-EV	Maintenance tool (Upgrade)
GX Converter	SW□D5C-CNVW-E	Excel®/text data converter
GX Configurator-AD (Note 7)	SW□D5C-QADU-E	MELSEC-Q dedicated analog to digital module setting/monitoring tool
GX Configurator-DA (Note 7)	SW□D5C-QDAU-E	MELSEC-Q dedicated digital to analog module setting/monitoring tool
GX Configurator-SC (Note 7)	SW□D5C-QSCU-E	MELSEC-Q dedicated serial communication module setting/monitoring tool
GX Configurator-CT (Note 7)	SW□D5C-QCTU-E	MELSEC-Q dedicated high speed counter module setting/monitoring tool
GX Configurator-TC (Note 7)	SW□D5C-QTCU-E	MELSEC-Q dedicated temperature control module setting/monitoring tool
GX Configurator-TI (Note 7)	SW□D5C-QTIU-E	MELSEC-Q dedicated temperature input module setting/monitoring tool
GX Configurator-FL (Note 7)	SW□D5C-QFLU-E	MELSEC-Q dedicated FL-net module setting/monitoring tool
GX Configurator-PT (Note 7)	SW□D5C-QPTU-E	MELSEC-Q dedicated QD70P positioning module setting/monitoring tool
GX Configurator-AS (Note 7)	SW□D5C-QASU-E	MELSEC-Q dedicated AS-i master module setting/monitoring tool
GX Configurator-QP (Note 7)	SW□D5C-QD75P-E	MELSEC-Q dedicated QD75P/D positioning module setting/monitoring tool
GX RemoteService-I	SW□D5C-RAS-E	Remote access tool
	SW□D5C-RAS-EV	Remote access tool (Upgrade)
GX Works	SW□D5C-QSET-E	A set of seven products, GX Developer, GX Simulator, GX Explorer, GX Configurator-AD, DA, SC, CT
	SW□D5C-GPPLLT-E	A set of three products, GX Developer, GX Simulator, GX Explorer

MELSOFT PX Series

PX Developer (Note 7)	SW□D5C-FBDQ-E	FBD Software package for process control
PX Works	SW□D5C-FBDGPP-E	A set of two products, PX Developer, GX Developer

MELSOFT MX Series

MX Component	SW□D5C-ACT-E	Active X library for communication
MX Sheet	SW□D5C-SHEET-E	Excel®communication support tool
MX Works	SW□D5C-SHEETSET-E	A set of two products, MX Component, MX Sheet

MELSOFT MT Series

MT Developer	SW□RNC-GSVPROE	Integral startup support software for Q Motion
	SW□RNC-GSVSETE	Integral startup support software for Q Motion + A30CD-PCF SSC I/F card + Q170CDCBL3M cable

PC I/F Board

MELSEC NET/H	SI/QSI optical cable	Q80BD-J71LP21-25	PCI bus Japanese/English OS compatible SI/QSI optical cable duplex loop PLC-to-PLC network (control station, normal station)
	GI-50/125 optical cable	Q80BD-J71LP21G	PCI bus Japanese/English OS compatible GI-50/125 optical cable duplex loop PLC-to-PLC network (control station, ordinary station)
	GI-62.5/125 optical cable	Q80BD-J71LP21GE	PCI bus Japanese/English OS compatible GI-62.5/125 optical cable duplex loop PLC-to-PLC network (control station, ordinary station)
	Coaxial cable	Q80BD-J71BR11	PCI bus Japanese/English OS compatible 3C-2V/5C-2V coaxial cable simplex bus PLC-to-PLC network (control station, ordinary station)
CC-Link		A80BDE-J61BT11	PCI bus Japanese/English OS compatible Shared by master station and local station
		A80BDE-J61BT13	PCI bus Japanese/English OS compatible local station

Note 1) Compatible only with high-performance module
Note 2) "Positive common" refers to using the sensor with the positive DC power connected to the common terminal. "Negative common" refers to using the sensor with the negative DC power connected to the common terminal.
Note 3) The connector is not enclosed. Prepare the A6CON1, A6CON2, A6CON3 or A6CON4 connector.
Note 4) No connector is provided. Please acquire the A6CON1E/A6CON2E/A6CON3E separately.
Note 5) No connector is provided. Please acquire the A6CON1/A6CON2/A6CON3 separately.
Note 6) Runs at the Windows command prompt.
Note 7) Not compatible with the A mode.

※ Always refer to the "Q series data book" for information on usable modules and restrictions, etc., before starting use.
※ Refer to MELFANSweb or contact your nearest sales office for the latest information on the MELSOFT versions and compatible OS.

Mitsubishi Programmable Logic Controller

Precautions for Choosing the Products

This catalog explains the typical features and functions of the Q series PLCs and does not provide restrictions and other information on usage and module combinations. When choosing the products, always check the detailed specifications, restrictions, etc. of the products in the Q series data book. When using the products, always read the user's manuals of the products.
Mitsubishi will not be held liable for damage caused by factors found not to be the cause of Mitsubishi; machine damage or lost profits caused by faults in the Mitsubishi products; damage, secondary damage, accident compensation caused by special factors unpredictable by Mitsubishi; damages to products other than Mitsubishi products; and to other duties.

⚠ For safe use

- To use the products given in this catalog properly, always read the "manuals" before starting to use them.
- This product has been manufactured as a general-purpose part for general industries, and has not been designed or manufactured to be incorporated in a device or system used in purposes related to human life.
- Before using the product for special purposes such as nuclear power, electric power, aerospace, medicine or passenger movement vehicles, consult with Mitsubishi.
- This product has been manufactured under strict quality control. However, when installing the product where major accidents or losses could occur if the product fails, install appropriate backup or failsafe functions in the system.

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